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NAVAL POSTGRADUATE SCHOOL

Monterey, California

THESIS

AN ANALYSIS OF THE CORRELATION

BETWEEN

BUDGET ASSERTIVENESS AND BUDGET SUCCESS

by

Joseph Scarpa

December 1988

Thesis Advisor: Jerry L. McCaffery

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b RESTRICTIVE MARKINGS
2a SECURITY CLASSIFICATION AUTHORITY	3 DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution is unlimited
2b DECLASSIFICATION/DOWNGRADING SCHEDULE	
4 PERFORMING ORGANIZATION REPORT NUMBER(S)	5 MONITORING ORGANIZATION REPORT NUMBER(S)
6a NAME OF PERFORMING ORGANIZATION Naval Postgraduate School 6b OFFICE SYMBOL (If applicable) 36	7a NAME OF MONITORING ORGANIZATION Naval Postgraduate School
6c ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000	7b ADDRESS (City, State, and ZIP Code) Monterey, California 93943-5000
8a NAME OF FUNDING/SPONSORING ORGANIZATION 8b OFFICE SYMBOL (If applicable)	9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c ADDRESS (City, State, and ZIP Code)	10 SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO / WORK UNIT ACCESSION NO.

11 TITLE (Include Security Classification)

AN ANALYSIS OF THE CORRELATION BETWEEN BUDGET ASSERTIVENESS AND BUDGET SUCCESS

12 PERSONAL AUTHOR(S)
Scarpa, Joseph

13a TYPE OF REPORT	13b TIME COVERED	14 DATE OF REPORT (Year, Month, Day)	15 PAGE COUNT
Master's Thesis	FROM _____ TO _____	December 1988	142

16 SUPPLEMENTARY NOTATION
The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

17 COSATI CODES			18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Budget Assertiveness; Congressional Behavior; Budget Success; Appropriations Model; Budget Strategy; Budget Request

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

This thesis studies the relationship between budget assertiveness and budget success in various Department of Defense budget accounts. It covers the budget formulation and Congressional enactment phase. It presents a model to discuss determinants of budget success and then focuses on one major component of success, assertiveness, defined as the percentage increment requested. The percentage increment appropriated is shown to be significantly correlated with the percentage increment requested. The budget accounts which seem to be most rewarded by budget assertiveness for Fiscal Years 1977 - 1988 are Procurement, Marine Corps; the four services' Military Personnel accounts; Other Procurement, Air Force; and Other Procurement, Army. The budget accounts which seem least responsive to budget assertiveness are Aircraft Procurement, Navy; Weapons Procurement, Navy; and Research, Development, Test, and Evaluation, Army.

20 DISTRIBUTION/AVAILABILITY OF ABSTRACT	21 ABSTRACT SECURITY CLASSIFICATION
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	UNCLASSIFIED
22a NAME OF RESPONSIBLE INDIVIDUAL Jerry L. McCaffery	22b TELEPHONE (Include Area Code) (408) 646-2554 22c OFFICE SYMBOL 54Mm

DD FORM 1473, 84 MAR 83 APR edition may be used until exhausted
All other editions are obsolete

SECURITY CLASSIFICATION OF THIS PAGE

☆ U.S. Government Printing Office: 1986—606-24

Approved for public release; distribution is unlimited.

An Analysis of the Correlation
between
Budget Assertiveness and Budget Success

by

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Lieutenant, Supply Corps, United States Navy
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Submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
December 1988

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ABSTRACT

This thesis studies the relationship between budget assertiveness and budget success in various Department of Defense budget accounts. It covers the budget formulation and Congressional enactment phase. It presents a model to discuss determinants of budget success and then focuses on one major component of success, assertiveness, defined as the percentage increment requested. The percentage increment appropriated is shown to be significantly correlated with the percentage increment requested. The budget accounts which seem to be most rewarded by budget assertiveness for Fiscal Years 1977 - 1988 are *Procurement, Marine Corps;* the four services' *Military Personnel* accounts; *Other Procurement, Air Force;* and *Other Procurement, Army.* The budget accounts which seem least responsive to budget assertiveness are *Aircraft Procurement, Navy; Weapons Procurement, Navy;* and *Research, Development, Test, and Evaluation, Army.*

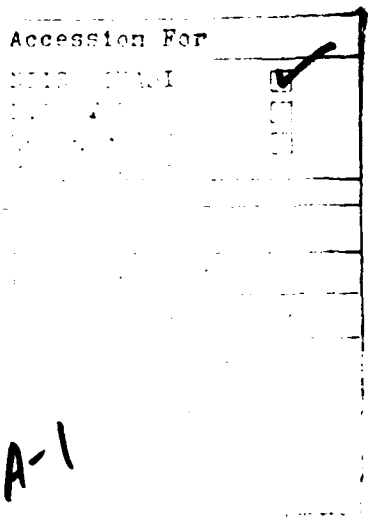

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TABLE OF ABBREVIATIONS

APN	Aircraft Procurement, Navy
APPRT'D	Appropriated
APPRT'N	Appropriation
BA	Budget Activity
BY	Budget Year
CBO	Congressional Budget Office
CNO	Chief of Naval Operations
CY	Current Year
DoD	Department of Defense
DON	Department of the Navy
FY	Fiscal Year
GAO	General Accounting Office
GNP	Gross National Product
HAC	House Appropriations Committee
HASC	House Armed Services Committee
HBC	House Budget Committee
INC	Increment
IQR	Interquartile Range
JCS	Joint Chiefs of Staff
MOE	Measure of Effectiveness
MPN	Military Personnel, Navy
NAVCOMPT	Comptroller of the Navy
NOA	New Obligation Authority
O&M,N	Operation and Maintenance, Navy
OMB	Office of Management and Budget
OPM	Office of Personnel Management
OPN	Other Procurement, Navy
OSD	Office of the Secretary of Defense
POM	Program Objective Memoranda
PPBS	Planning, Programming, and Budgeting System
PY	Past Year
R^2	Coefficient of Determination
RDT&E,N	Research, Development, Test, and Evaluation, Navy
REQ'D	Requested
SAC	Senate Appropriations Committee
SASC	Senate Armed Services Committee
SBC	Senate Budget Committee
SCN	Shipbuilding and Conversion, Navy
SECDEF	Secretary of Defense
SECNAV	Secretary of the Navy
TOA	Total Obligation Authority
TQ	Transition Quarter
WPN	Weapons Procurement, Navy
ZBB	Zero-Based Budgeting

LIST OF TABLES

I. INTRODUCTION

A. STATEMENT OF PURPOSE

This thesis studies the relationship between budget assertiveness and budget success for fiscal years 1977 - 1988. A model is designed to study the correlation between the amount of the annual percentage change requested in an agency's budget to the amount of the percentage change appropriated with regard to a common baseline. The strength of the relationship will be used to suggest a budget strategy most likely to contribute to growth.

The relationship between government agencies and their budget reviewers is explored. The thesis argues that ardent program advocacy serves the public interest because 1) agencies are best able to determine their capabilities; 2) competition among public agencies for scarce resources trims the fat; and 3) budget reviewers are better able to determine a program's marginal contribution if they have more information. It is hypothesized that aggressive budget requests--within a certain range--will result in either larger growth of DoD's budget accounts or more efficient allocation among them, or both.

B. IDENTIFICATION OF HYPOTHESIS

There are many variables--political, socioeconomic, and military--that determine the degree of budget success for the Department of Defense (DoD). This thesis hypothesizes that growth in the DoD budget and within the various budget accounts is highly

related to the degree of assertiveness displayed in the budget formulation and Congressional enactment phase.

The study compares budget request increments to the actual increments appropriated, as a percentage of a common base. This thesis is not intended to explain or predict an annual level of defense expenditures, but rather an annual increment. Success is measured not in terms of what percentage of the budget request is appropriated, but in terms of what percentage increment is appropriated over the base.

The primary research question is whether an agency is better off to ask for a large annual increment to its budget, or rather to request the amount it reasonably expects to receive. Subsidiary research questions include the efficacy of assertiveness with regard to agency credibility and public support for the long term.

The reasons for a proposed budget change--fiscal, programmatic, or other--are not addressed in this thesis. This thesis concentrates on Congressional action regarding the percentage amount of budget change.

For purposes of this thesis, "agency" refers to departments and establishments of the Federal Government.

II. BACKGROUND

A. BUDGET CONCEPTS

This section synopsizes the federal budget process with an emphasis on defense. The advanced reader may skip this section and proceed to Section B - Survey of Related Literature.

The fiscal year for the federal government runs from 1 October through 30 September. For example, Fiscal Year 1992 will commence 1 October 1991 and end 30 September 1992. It is abbreviated as FY 92.

The Office of Management and Budget (OMB) consolidates all departments' budgets for the President. The President submits this budget to Congress by the first Monday after the third of January, e.g., the FY 92 budget must be submitted by 7 January 1991. The Army, Navy, Marine Corps, Air Force, and other Defense agencies submit their budget requests to the Office of Secretary of Defense (OSD) significantly before then. All executive branch agencies must have their FY 92 budgets to OMB by 1 September 1990. DoD, unique among the Departments, has submitted a biennial budget for FY 88/89 and FY 90/91, although Congress has yet to enact a two-year budget. In any event, biennial budgeting is not relevant to this thesis.

Continuing the example, if today is 25 December 1990, then FY 92 is called the Budget Year (BY); FY 91 is the Current Year (CY); and FY 90 is the Past Year (PY).

DoD uses a particular form of budgeting called the Planning, Programming, and Budgeting System (PPBS). The Joint Chiefs of Staff (JCS) design plans to counter the military threat to the United States. The services propose programs to meet JCS plans. Upon initial approval of programs by the Secretary of Defense, the services prepare detailed budget estimates that fulfill the program. The service comptrollers breakdown their component budget estimates and "crosswalk" or amalgamate the estimates into appropriation accounts. The annual DoD Appropriations Act provides funds by title, account, and line item.

Table 1 identifies the major FY 77 - 88 component accounts within the *Department of Defense--Military* appropriations titles. Brackets [ ] enclose those accounts which no longer exist. Brackets [ ] with a fiscal year inside show the last year for which budget authority was appropriated. Braces { } show the first fiscal year the newer accounts were established. Definitions used by DoD and Congressional appropriations language have essentially remained the same for the years studied in this thesis. Explanations of the major Defense appropriations are provided in the *Budget of the United States Government, Appendix* and are summarized at the end of the table.

TABLE 1

***DEPARTMENT OF DEFENSE--MILITARY* APPROPRIATIONS**

MILITARY PERSONNEL

ACTIVE FORCES

Military Personnel, Army
Military Personnel, Navy
Military Personnel, Marine Corps
Military Personnel, Air Force

RESERVE FORCES

Reserve Personnel, Army
Reserve Personnel, Navy
Reserve Personnel, Marine Corps
Reserve Personnel, Air Force
National Guard Personnel, Army
National Guard Personnel, Air Force

[RETIRED MILITARY PERSONNEL]

[Retired Pay, Defense] [1984]

OPERATION AND MAINTENANCE

Operation and Maintenance, Army
Operation and Maintenance, Navy
Operation and Maintenance, Marine Corps
Operation and Maintenance, Air Force
Operation and Maintenance, Defense Agencies
Operation and Maintenance, Army Reserve
Operation and Maintenance, Navy Reserve
Operation and Maintenance, Marine Corps Reserve
Operation and Maintenance, Air Force Reserve
Operation and Maintenance, Army National Guard
Operation and Maintenance, Air National Guard
Civilian and Military Pay Raises {1987}

TABLE 1 (Cont'd)

***DEPARTMENT OF DEFENSE--MILITARY* APPROPRIATIONS**

PROCUREMENT

[Procurement of Equipment and Missiles, Army] [1971]
Aircraft Procurement, Army {1972}
Missile Procurement, Army {1972}
Procurement of Weapons
and Tracked Combat Vehicles, Army {1972}
Procurement of Ammunition, Army {1972}
Other Procurement, Army {1972}
[Procurement of Aircraft and Missiles, Navy] [1973]
Aircraft Procurement, Navy {1974}
Weapons Procurement, Navy {1974}
Shipbuilding and Conversion, Navy
Other Procurement, Navy
Procurement, Marine Corps
Aircraft Procurement, Air Force
Missile Procurement, Air Force
Other Procurement, Air Force
Procurement, Defense Agencies

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

Research, Development, Test, and Evaluation, Army
Research, Development, Test, and Evaluation, Navy
Research, Development, Test, and Evaluation, Air Force
Research, Development, Test, and Evaluation, Defense Agencies
[Director of Test and Evaluation, Defense] [1986]
Developmental Test and Evaluation, Defense {1987}
Operational Test and Evaluation, Defense {1987}

MILITARY CONSTRUCTION*

FAMILY HOUSING, DEFENSE*

REVOLVING AND MANAGEMENT FUNDS*

*See *Budget of the United States Government, Appendix* for further breakdown of these accounts.

TABLE 1 (Cont'd)

***DEPARTMENT OF DEFENSE--MILITARY* APPROPRIATIONS**

MILITARY PERSONNEL appropriations provide for the pay and allowances of officers, enlisted personnel, cadets, and midshipmen; the subsistence of enlisted personnel; permanent change of station travel; and other military personnel costs. Beginning in 1985, these appropriations also finance the future retirement benefits of the current active forces. Changes in financial requirements are primarily related to military personnel strengths in support of the military programs. The budget request for Military Personnel does not include pay raises.

The **RETIRED PAY, DEFENSE** appropriation included funds for the pay of all personnel on the military retired lists for the Department of Defense. Included were the consolidated requirements of the military departments for: (a) payments to retired officers and enlisted personnel of the Army, Navy, Marine Corps, and Air Force; (b) retainer pay of enlisted personnel of the Fleet Reserve of the Navy and Marine Corps; and (c) survivors' benefits. As a result of the change to accrual accounting for military retirement enacted in the 1984 Defense Authorization Act (PL 98 - 94), this appropriation was discontinued in 1985 and a Military Retirement Trust Fund was established within the *Department of Defense--Civil account*.

OPERATION AND MAINTENANCE (O&M) appropriations finance the day-to-day costs, except military personnel costs, of operating and maintaining the Armed Forces. These funds include amounts for pay of civilians, contract services for maintenance of equipment and facilities, fuel, supplies, and repair parts for weapons and equipment. Financial requirements for these appropriations are influenced by a variety of factors, the principal of which are force levels, such as the number of aircraft squadrons or Army or Marine Corps divisions, military strength and deployments, rates of operational activities, number of installations, and quantity and complexity of major equipment (aircraft, ships, missiles, tanks, et cetera) in operation.

TABLE 1 (Cont'd)

***DEPARTMENT OF DEFENSE--MILITARY* APPROPRIATIONS**

PROCUREMENT appropriations finance the acquisition of large dollar value combat, combat support, and training and communications equipment; air, ground, and ship munitions; major items for support of equipment when it is in use; industrial facilities necessary to produce that equipment; and major modifications of on-hand equipment where increased capability can be achieved without buying new equipment. The equipment financed by these appropriations is bought primarily from private contractors or, when necessary, produced in government arsenals, shipyards, and plants.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION (RDT&E) programs support the modernization of the Armed Forces through a broad range of activities. In addition to development and testing of full-scale, pre-production hardware, these programs insure that the United States and its allies maintain a distinct technological advantage over potential adversaries through development of prototype hardware, fabrication of technology-demonstration devices and support of military research and exploratory development. Work is performed by industrial contractors, government laboratories, universities, and non-profit organizations. Research and development programs are normally funded so that each year's resources support one year's increment of the total program cost.

The President is required to submit a *Current Services Estimate* when he submits his budget request, the definition and purpose of which is described in OMB Circular No. A-11:

> ... the proposed budget authority and estimated outlays that would be included in the budget if all programs and activities were carried on at the same level as in the fiscal year in progress and without policy changes in such programs and activities (31 U.S.C. 1109(a)). This current services information, together with supporting information, such as economic assumptions and program caseloads, is used to assess the size and direction of the budget and as a base against which alternatives, including the President's budget proposals, can be evaluated. (1988, p. 61)

Submission of the President's Budget to Congress ends the Budget Formulation phase and begins the Congressional Enactment phase. The major Congressional committee players during this phase are the *Budget*, *Appropriations*, and *Authorizations* committees. Throughout the process, agency heads and other experts present their views on the President's Budget at committee and subcommittee hearings. Differences in bills passed by the House or Senate are resolved by an ad hoc *Conference Committee* before they can be sent to the President for signature. Once signed, the appropriations and authorizations bills become law--and with regard to DoD are referred to as the DoD Authorization Act, 19XX and the DoD Appropriations Act, 19XX for the appropriate fiscal year.

Prior to considering authorization and appropriations measures, the House and Senate pass a *Concurrent Resolution on the Budget* which sets forth appropriate levels of *budget authority* and *outlays* by major function, e.g., national defense, international affairs, etc. The *Concurrent Resolution on the Budget* ostensibly is a legislative device for the Congress to regulate itself. Beginning with FY 87, Gramm-Rudman-Hollings makes the budget resolution totals immediately binding on the Congress. It is not a law and does not require a presidential signature.

The *authorization* process establishes federal programs to respond to national needs. The Senate has 16 authorizing committees; the House has 19. The *Senate Armed Services Committee (SASC)* and the *House Armed Services Committee (HASC)* are the standing authorization committees for defense programs. The *Senate*

and *House Appropriations Committees (SAC/ HAC)* are responsible for creating *budget authority* and to fund those programs created by the authorization committees. Each chamber has one appropriations committee with various subcommittees whose jurisdiction roughly corresponds to that of the authorizing committees.

The reader is cautioned not to confuse *budget authority* with the authorization process. When Congress appropriates funds for a program, it is creating budget authority, i.e., legal authority for an agency to enter into obligations which will result in outlays. For most DoD programs, budget authority becomes available each year only as voted by the Congress in annual appropriations acts; this is called current budget authority. The Military Retirement Trust Fund is an example of a program with permanent budget authority, under which funds become available annually without further Congressional action.

Outlays are disbursements by the Treasury, e.g., the actual issuance of a check. They occur in the same or subsequent years that DoD obligates its funds. For example, ninety eight percent of *Military Personnel* monies are paid out the same year as the obligation; *Procurement* experiences a slower outlay rate because contractor bills are paid only as construction progresses. The deficit is calculated as *Outlays* minus *Revenues*.

This thesis is concerned with Congressional behavioral response to DoD budget assertiveness and hence will deal primarily with *budget authority*.

B. SURVEY OF RELATED LITERATURE

1. Schools of Thought: "Assertiveness" vs "Realism"

This subsection summarizes the basic arguments for and against agency assertiveness--sometimes called advocacy or acquisitiveness--from a broad array of literature (national strategy, political economy, and public administration), and suggests a consensus view. Subsection 2 will summarize the findings of previous studies regarding the efficacy of agency assertiveness.

Assertiveness, the focus of this thesis, may be defined as the tendency for agencies to pursue an active strategy of expansion in their programs and fundings (LeLoup 1978, p. 233). Some political scientists assert that agency self-advocacy and assertiveness aid decision makers in providing efficient, effective, and equitable resource allocation among public services (Wildavsky 1988).

Secretary of Defense Caspar Weinberger was noted for his recalcitrance in his quest for budgetary resources. Critics admonished that DoD would have fared better in budget deliberations if the Secretary would have been "realistic". Rudolph Penner, Congressional Budget Office Director from September 1983 to April 1987, opines that the Pentagon's refusal to delineate priorities is a cause for legitimate complaint by Congress, because they probably could have cut more efficiently if they had more precise recommendations from the military (Clark 1987). Others have suggested that agency heads should heed the new political climate,

volunteer to tighten their belts, and submit realistic budgets. (Morrison 1986; Carrington 1987)

However, there is no mechanism where an agency head can properly determine some other agency's program to be more or less beneficial to the nation than his own program, or, borrowing a term from economic theory, its marginal contribution. Cabinet officials are appointed by the President to shepherd his interests in that area; additionally, they take an oath to preserve, protect, and defend the U.S. Constitution. Secretary Weinberger's axiom was that as you decrease the defense budget, you increasingly put national security at risk. He would have been remiss to suggest we can maintain national security no matter what the defense budget.

Total comprehension of the activities and budgets of the four services are beyond the ability of any human legislator, "so the executive and legislative officers focus most of their review on the proposed increments and reveal their priorities by approving different proportions of these." (Niskanen 1971, p. 40)

What is needed is not a compromise on defense spending but a consensus on what national security requires. Intense budget deliberations provide a framework for that consensus, ensure that funds are spent prudently, and efficiently equalize the marginal return to diverse government expenditures. Since the federal budget is a mechanism for formulating and implementing policy, all budgetary decisions with policy implications should be made at as high a level as practicable. The responsibility for determining realistic budgets should rest with budget reviewers, not budget submitters.

A senior research fellow at the Hoover Institute puts the policy implications of either school of thought this way:

> The problem of accounting for the role of administrative agencies in a democratic system has concerned students of the diverse fields of administrative law, public administration, and American politics. From the standpoint of each of these scholarly pursuits, the proper balance between the exercise of administrative discretion and legislative policy formation is hard to strike. Is an agency merely to act as a neutral "transmission belt" translating the legal expressions of the legislature into decisions on particular cases? Or is it instead supposed to operate a surrogate political process that has the purpose and effect of "adjusting policy?" And, if it turns out that the second possibility is the only practical one, what then becomes the distinction between the legislative and administrative processes? (Ferejohn 1987, p. 455)

Davis, et al. (1966) suggest that agencies generate increased expenditures through advocacy, but that their credibility will suffer a drastic decline if they ask for amounts much larger than the appropriating bodies believe reasonable. While not proving or disproving this statement, empirical analysis of recent budgetary data as presented in this thesis does suggest boundaries for assertiveness for various DoD accounts.

Budgetary decision making calls for a division of labor much like Adam Smith's pin factory. Historically, the agency plays the role of advocate. Wildavsky (1988) argues that we should continue this as no one understands agency programs better than the agency itself. Agency directors aid the budget review and policy management process by forcefully advocating their specific programs.

Defense policy expert Roger Hilsman (1987) notes:

> The function that [political appointees] perform is to analyze problems in their area of responsibility, to recommend policy to deal with those problems, and to attempt to build support for their recommendations--in a word, to be the advocates of policy. (p. 153)

> The military have been given responsibility for the nation's security, and it is their duty to fight hard for strong defenses, large armies, navies, and air forces, and the latest, most powerful, and most sophisticated weapons. (p. 310)

Policy setters--Congress and the President--can best set priorities and ascribe their marginal values if given all available information and arguments. In the context of top management appraisal capability, a Navy management review noted the following with regard to information systems:

> Adequate information is essential to the executive. On it he bases his decisions; through it he communicates these decisions to others. Thus, it is through information channels that the executive establishes and maintains control over his organization. Information ties the various management processes and operating functions into a meaningful whole. (U.S. Navy 1962, p. 67)

A political scientist from the University of Washington argues the productivity enhancing effect of competition this way:

> Competition, rivalry, and advocacy are all there to be used by the decision maker. The fundamental argument is that it is in the self-interest of a principal decision maker to place subordinates in competition so as to gain from the interplay of their self-interest. Bureaucracy often tries to minimize competition, to have tables of organization and clear functional that emphasize cooperation. But the organizational neatness that makes for order in the life of the bureaucrat can render the organization complacent or arrogant toward criticism and questioning. Too much cooperation within can be deadening. The threat of scrutiny and challenge should be there, both from within and without. (Williams 1986, p. 59)

Inter-agency rivalry harnesses the benefits of competition within the government as suggested by an economist:

> Rather than seeing harmony, tranquility, and placidity as pleasing social and economic conditions, [economists] view them as omens of possible stagnation and lethargy. As long as irritation arises from informed presentation of alternative courses of economic choice, there seems little reason to attach as much distaste to it as we now do. (Patterson 1964, p. 13)

Public programs are ostensibly initiated to increase citizen welfare. They are an expression of political values, an allocation and distribution of specific, limited public resources (Mokwa 1981, p. 83). Successful public administrators (budget submitters) mix political management with technical management to attain increased funds which ostensibly increases their probability of mission success.

At first glance it seems that such a free-for-all approach will lead to a no-holds-barred budget grab by federal agencies and increase interservice rivalry. However, it is this very competition for resources that will force all participants to fully scrutinize their programs in the course of preparing budget justifications. Decision makers (budget reviewers with a bias to cutting) are confronted with a myriad of choices to provide for the public interest. They are also influenced by various forces--a fight for reelection, internal organizational politics, perception of public need--as they make decisions on different programs.

While attempting to prevail in the budget struggle, the self-interested manager will be providing hard evidence to budget reviewers and enabling more prudent decision making. This modifies incrementalist theory which asserts that this year's budget is a function of last year's with all agencies receiving their fair share of the increment. Increased advocacy in the budget process permits a thorough review of any agency's requested increment and a rigorous comparison with other programs without a turn towards zero-based budgeting.

Recent literature suggests that legislatures should not reveal their demand preferences for agency output to the agency. This demand uncertainty aids the legislature in its oversight responsibility because it restrains an agency from either exploiting its expertise, or misrepresenting its output capability (Bendor 1985; Miller 1983). Agency officials do not and cannot know for sure what will happen at Congressional appropriations hearings (LeLoup 1984, p.85). In this paradigm, agencies must play the complementary role of providing Congress with all applicable information. Congressman Les Aspin (1973, p. 81) asserts: "The overriding issue in defense can be reduced to a simple, straightforward question ... How much is enough?"

Lieutenant Jack Housley, United States Navy (1986), concludes the following on proper claimant strategies:

> The most important strategy available to a claimant is to ask for a budget increase. Budget changes are most closely related to the budget requested by the claimant than to the budget changes made by NAVCOMPT or OSD/OMB. The support of the reviewing bodies helps maintain budget changes requested. But first a claimant must request an increase or no budget increase will be forthcoming. (p. 40)

Given that you should ask for a budget increase, this thesis addresses how much to ask for and how to ask for it. It will discuss to what degree an assertive budget request affects an agency's resources.

2. Previous Studies on Budget Success

Lance T. LeLoup (1978, p. 232) decries the "dearth of empirical evidence on the actual behavior, role, and strategies of individual agencies, departments and the Office of Management and

Budget." This section surveys the literature on budget success (most of which appears to be less than two decades old).

Ira Sharkansky (1968) has shown that aggressiveness is a prerequisite for a substantial budget increase. Sharkansky also finds a high correlation between gubernatorial support and agency budget success. It seems to be a safe extrapolation to further suggest that presidential support of an initiative--budgetary or otherwise--is essential for federal agency success. Sharkansky's research only covered one fiscal year, and the resultant budget increases could have been a result of a favorable climate for increased government spending. Housley (1986) tracked Operations and Maintenance, Navy budget requests over three years (FY 1985 - 87) concluding that the most assertive agencies came away with the most substantial, non-incremental changes in appropriations.

Davis, Dempster, and Wildavsky (1966) studied non-defense federal agency budgets finding that this year's budget can be modeled as a percentage of last year's budget plus a random variable.

Natchez and Bupp (1973) note that Davis et al. ignore the competition among alternative programs in their formulation of simple linear decision rules:

> ... the budgetary process produces a climate of scarcity in which the success of those who participate is measured by the number of dollars they are able to win. Indeed, the entire process of formulating budgets within agencies plays upon the institutional interests of bureaucrats so as to produce the explicit competition between alternative "policies." (p. 953)

> Priorities are established by aggressive entrepreneurs at the operating levels of government. Programs prosper because energetic division directors successfully build political support to withstand continuous attacks upon a program's resource base by competing claims. (p. 963)

They imply that it is the President's administration--the program directors and operating-level bureaucrats--who set policy, and the role of the President is that of "dispute-settling".

Terry (1973) and Wood (1975) buttress Davis' et al. contention that the non-defense appropriations process may be modeled by simple (basically incremental) decision rules and is equally applicable to defense budgeting. Wood (p. 96) shows linear regression analysis to be feasible with only one decision variable, except for the Procurement account, disaggregated below the Service level, and finds little improvement in model fit when adjusting for inflation.

Richard Fenno (1966, ch. 8) discusses the two measures used by Appropriations Committee members: 1) the percentage of the agency's budget estimate approved by the Committee, and 2) the comparison of what the Committee approves this year with what they approved last year, i.e., the increment expressed as a percentage of last year's appropriation. He finds no correlation ($r^2 = 0.0$) between the two measures for the agencies studied. Fenno finds that the agencies with the highest growth rates for fiscal years 1947 through 1962 also have the biggest appropriations appetites and suggests that growth is a function of appetite. He states that the House Appropriations Committee's dominant response to agency requests is to "grant an increase over the previous year's appropriation but, at the same time, to reduce their estimates." (p. 410) In this thesis, we equate Fenno's "appropriations appetite" and "growth" with budget assertiveness and success.

Kanter (1972) finds that Congressional activity, measured by the dollar amount and frequency of changes to the President's budget, have been concentrated in *Procurement* and *RDT&E* with less Congressional involvement in *Military Personnel*.

Korb (1972) and Blackmon (1975) corroborate Kanter's findings although Korb is not so ready to conclude that Congressional activity on the defense budget is primarily programmatic. Korb suggests that Congressional action is more fiscal within the *Procurement* and *RDT&E* programs in that they rarely cancel a program outright, but merely delay it.

Anderson (1983) analyzes growth in the four major appropriations titles with respect to their changing shares of the total defense budget. He finds that, as a percentage share basis of the DoD Budget, *Operation and Maintenance* and *Military Personnel* have the lowest v latility from year to year regardless of DoD's overall budget success. *Procurement* takes the largest share of the increment when DoD budget success is high. When budget success is low, *Research, Development, Training, and Evaluation (RDT&E)* seems to maintain its relative share of the budget the best among the four titles, holding steady at 9 to 10 percent of the total.

Shockley (1985) focuses on the political persuasion exerted on Congress by the Executive branch (SECDEF and the President). He shows that in years of top growth (measured as the net percentage change in DoD outlays and GNP), the President's budget message and/or witnesses in Congressional hearings characterized current military strength as "inadequate." In contrast, current military

strength was characterized as "adequate" for the ten distinct fiscal years that Shockley determined to be marked by stable or declining DoD budgets relative to GNP growth.

Congressional resource allocation has several dimensions--technical and political--and merits attention. This thesis will study and disaggregate the DoD budget below the appropriations title level, analyzing the performance of specific budget accounts. It will thus avoid the criticism directed at those analyses which used the entirety of the DoD budget as the "base".

C. MODELING DEPARTMENT OF DEFENSE BUDGET SUCCESS[1]

Some of the literature presents formal models to explain U.S. defense expenditure decision making. These models are often too theoretical for more than occasional use in DoD and not particularly useful to the practitioner. This thesis investigates the simple rule of thumb "he who asks for more, gets more" through development of an empirical model.

First, we recognize that one responsibility of the Secretary of Defense is to obtain the optimum amount of resources that will protect the interests of the United States throughout the world. That includes enough resources in the short term to counter any immediate threat, and sufficient resources over the long term which will permit a prudent defense at minimum impact to the national economy.

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[1]I am indebted to Giordano, Frank R. and Maurice D. Weir, *A First Course in Mathematical Modeling*, Monterey: Brooks/Cole Publishing Company, 1985, which forms the basis for this section.

Since the U.S. Constitution gives Congress the sole responsibility and authority to appropriate resources for the national defense, we seek to identify those factors that induce Congress to provide the amount of resources we deem necessary to carry out our responsibilities. For example, federal agencies experience varying degrees of success in increasing their budgets; we can conjecture reasons for that success such as constituent interests, public consensus, and agency assertiveness.

We are interested in understanding how sensitive Congress is to certain variables in the appropriations--or resource allocation--process. As discussed in Section B, there is little agreement on what those variables are, let alone their relative importance. We cannot hold all but one variable constant and observe Congressional reaction as we change that one variable, and then repeat the process for each variable, one at a time, to draw a definitive conclusion. We can, however, identify the primary factors involved in the resource allocation decision making process, and conjecture tentative relationships among the factors, thereby constructing a rough "model" of Congressional behavior. We can then apply mathematical analysis to our model, and interpret how closely our mathematical conclusions approximate real-world behavior.

Model building is an iterative process. We may decide our model is unwieldy and simplify it by willingly ignoring less significant variables, combining several variables together, or making other simplifying assumptions (such as a linear relationship among some of the variables). On the other hand, we may decide the model is

too ambiguous and needs refinement, i.e., the addition of more variables, to better capture the real world situation.

Giordano and Weir (1985) suggest that a model may be evaluated across three main characteristics:

- *Fidelity*: the preciseness of a model's representation of reality.
- *Cost*: the total cost of the modeling process.
- *Flexibility*: the ability to change and control conditions affecting the model as required data is gathered.

The mathematical model developed in this thesis suffers a loss in fidelity: a severe simplification of the resource allocation decision making process is necessary to make the problem tractable. This doesn't necessarily mean that the model is of little use; it still provides a basis to draw valid conclusions about budget account activity. On the other hand, our model is not costly in that it is within the scope of a master's thesis and readily usable by anyone with a personal computer. Moreover, our model is generously flexible in that any number of variables or assumptions may be introduced. This trade-off between precision and simplicity permits the application of a simple rule-of-thumb, allows DoD users to update the model as empirical data becomes available, and permits other users to customize the model for their own agency.

We have identified our problem to be that of obtaining the necessary monies from Congress to defend the United States. (The delineation of exactly what it takes to "defend the United States" will be left to others). We now list those things that influence the behavior of Congressional resource allocation:

- agency aggressiveness or assertiveness
- agency program synchronization with President's ideology
- agency program synchronization with Congress' ideology

- interactive strategy implementation contingent on the seas of change in Congress
- publicity seeking behavior of Congress
- publicity seeking behavior of agency
- electoral cycle
- constituent needs
- depth and quality of agency marketing effort
- propensity of Service to end run OMB (or the President) to Congress
- Presidential support
- JCS support
- industry and citizen lobbies
- percentage of military voter participation
- reputation/expertise of agency head
- amount of Washington time in career of agency head
- quality and sincerity of agency head's presentation at hearing
- Congress' confidence in agency head/agency
- agency's past and current performance (or non-performance)
- degree of agency/agency head's honesty with Congress
- how well agency spent last year's funds
- how well agency spent last year's increment
- agency transfers and reprogramming actions
- number and dollar amounts of appropriation lapses
- analysis of costs/benefits
- degree to which agency used money appropriated in the previous year for purposes (initially) not authorized by the committee
- degree to which hearings witness acquiesced to Member's inquiries about feasibility of cuts
- economic outlook
- budget deficits
- cost of inputs to Department of Defense
- rate of increase or size of federal revenues
- defense budgets of allies
- perceived Soviet or other foreign threat
- "breakout" of peace

We consider all variables in this list to be independent, while the one variable we hope to explain, the actual increment appropriated expressed as a percentage over the current base, is considered dependent.

We neglect some variables such as cost/benefit analysis because their effects are relatively small compared to other variables. Other variables, such as agency head sincerity or honesty, are

ignored in our simplified model because they are too difficult to quantify. If it turns out they are significant to the outcome, they could be incorporated later into a more refined model.

We will further reduce the complexity of the problem by making the following assumptions about the DoD budgeting process and interrelationships between the variables:

(1) Congress begins the appropriations process only after receiving the President's Budget; this assumption permits greater weight on the importance of executive agency behavior in considering the budget.

(2) All budget requests submitted to Congress are reasonably substantiated and justified. This assumption is not unreasonable as agency heads and program managers usually will not risk their reputations by submitting a frivolous budget. Furthermore, by the time an agency's budget reaches Congress, it has been thoroughly scrutinized by the Service and DoD comptrollers and the Office of Management and Budget (OMB). This assumption dismisses the possibility of pie-in-the-sky requests and imposes responsible assertiveness.

(3) DoD officials must demonstrate accomplishment and productivity with past dollars expended to attain future dollars, particularly for military readiness, sustainability, and support costs, where there may be no specifically focused constituency. Budget sizing decisions become easy targets that are very difficult to defend against competent and cost-conscious congressional staffs; so there is an increased need for well-researched and

empirically based cost-effectiveness relationships for long-term government marketing programs. (Martin 1979, p. 91)

(4) The Appropriations Committee does not, as a rule, probe deeply into well-established programs with well-established bases of support. What it normally does is to check carefully what the agency did with the increase it was given last year and inquire into the purposes for which the current increase is used. (LeLoup 1984, p. 91)

(5) Previous studies (DSMC 1983) have shown no correlation between Soviet military spending and Congressional appropriations.[2]

(6) The Congressman faces the problem of allocating resources among many agency programs of enormous complexity and seeks a heuristic mechanism to aid in this decision process.

(7) The components of the DoD budget are formulated long before the proposed budget year and before final results are in on the "past year" or "current year". The Office of Management and Budget (OMB) conducts joint reviews of the Services' budgets with the Office of the Secretary of Defense (OSD). The use of final budget figures in this study obscures the pre-OMB/OSD budget struggle that occurs amongst and within the four Services--and may leaven the assertiveness factor somewhat. However, the OMB submittal to Congress combines relative Presidential support for various programs with the DoD dollar requests and serves to counteract the leveling of assertiveness at the OSD level.

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[2]See Looney (1988) for a different conclusion; see Mintz (1988, ch. 3) and Marra (1985) for a survey of studies showing conflicting evidence for this theory.

(8) We ignore the implication of Congressional reaction to DoD implementation of the "Assertiveness Model" developed in this thesis. Wood's preliminary testing showed little statistical significance for a refined interactive model (Wood 1975, p. 33, note 3).

We have now arrived at the model:

Budget success = f(budget assertiveness)

Solving and interpreting this model is discussed in Sections III and IV.

Is our model valid? Given the past studies conducted on budget success, we sense a certain agreement that the more assertive agencies obtain more funds than those who are not, and this squares with common sense. We would also expect that appropriations are an increasing function of assertiveness. Given the empirical basis of our model construction, we will need to be careful in that future appropriation increments can be predicted safely only within the range of the actual data utilized in our model.

The thesis will now analyze assertiveness as a suggested determinant of budget success, and quantify and suggest reasons for, the varying success of different accounts.

III. METHODOLOGY

A. DATABASE

The budget data for this study has been derived from the *Budget of the United States Government, Appendix* for Fiscal Years 1977 through 1989. Table 2 lists those DoD budget accounts chosen for analysis with abbreviations used in this thesis.

TABLE 2

DoD COMPONENT BUDGET ACCOUNTS

MILITARY PERSONNEL	
Military Personnel, Army	MPA
Military Personnel, Navy	MPN
Military Personnel, Marine Corps	MPMC
Military Personnel, Air Force	MPAF
OPERATION AND MAINTENANCE	
Operation and Maintenance, Army	OMA
Operation and Maintenance, Navy	OMN
Operation and Maintenance, Marine Corps	OMMC
Operation and Maintenance, Air Force	OMAF
PROCUREMENT	
Aircraft Procurement, Army	APA
Missile Procurement, Army	MPrA
Procurement of Weapons and Tracked Combat Vehicles, Army	PWA
Procurement of Ammunition, Army	PAA
Other Procurement, Army	OPA
Aircraft Procurement, Navy	APN
Weapons Procurement, Navy	WPN
Shipbuilding and Conversion, Navy	SCN
Other Procurement, Navy	OPN
Procurement, Marine Corps	PMC
Aircraft Procurement, Air Force	APAF
Missile Procurement, Air Force	MPrAF
Other Procurement, Air Force	OPAF

TABLE 2 (CONT'D)

DoD COMPONENT BUDGET ACCOUNTS

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

Research, Development, Test, and Evaluation, Army	RDTE,A
Research, Development, Test, and Evaluation, Navy	RDTE,N
Research, Development, Test, and Evaluation, Air Force	RDTE,AF

This data represents budgets that have been reviewed and approved up to and including the Office of Management and Budget. All budget request amounts have been adjusted to include any amendments to the budget request submitted to Congress before enactment of the DoD Appropriations bill.[3] The number of times the President's budget request was amended per fiscal year is provided, by account, in Table 3. These adjustments introduce some measurement error and a slight model formulation error. The budget request amendments are forwarded to Congress in varying amounts and at various times; a negligible measurement error is incurred as this study only deflates the total amount requested, as amended, once for each year. A model formulation error is introduced in that it is unclear whether amendments to the budget request reflect legitimate program reappraisals or an increasing recognition of Congressional sentiment. It is beyond the scope of this thesis to

[3]A statement of all amendments to or revisions in the budget authority requested with respect to the fiscal year in progress, made before the date of transmission of the upcoming budget, is included in each *Budget of the United States Government, Appendix*.

determine the influence of budget request revisions on the model, and this error will initially be assumed minimal.

TABLE 3

NUMBER OF BUDGET AMENDMENTS

ACCOUNT	78	79	80	81	82	83	84	85	86	87	88
MPA	1		1	2	2		1				
MPN	1		1	1	1		1				
MPMC				1	1		1				
MPAF	1		1	1	2		1				
OMA	1		1	2	3	2	1				
OMN	1		1	2	3	1	1				2
OMMC			1	2	2		1				
OMAF	1		1	2	3		1				
APA				1	2		1				
MPrA	1			1	2		1				
PWA	1			1	2	1	1				
PAA	1			1	2	1	1				
OPA	1			2	2	1	2				
APN	1			1	2		1				
WPN				1	2		1				
SCN	2			1	2		1				
OPN	1			2	2	1	2				
PMC				2	2		1				
APAF	2			1	2	3	1				
MPrAF	2		1	1	2	1	2				
OPAF	2		1	3	3	2	2				
RDTE,A	1			1	2	1	1				
RDTE,N	2			1	2	1	1				
RDTE,AF	2		1	1	3	2	2	2			1

Supplemental budget requests are excluded for simplicity. Many Supplementals are for non-controversial emergent requirements such as repair of typhoon damage or ship collisions, and usually receive a favorable response from Congress; inclusion of this data would distort the Congressional response to DoD assertiveness.

Actual Congressional appropriations for the previous fiscal year are provided in the *U.S. Budget Appendix;* these numbers were cross checked against the applicable Public Laws. Appendix A lists these DoD Appropriations Acts and other pertinent legislation for the convenience of the reader.[4]

I have chosen the years 1977 - 1988 because these years are post-conscription (ended in 1973) and post-Vietnam; Fiscal Year 1977 is the first year after the Congressional Budget and Impoundment Control Act for which a full budget was submitted and the first year for which a Current Services Estimate was required. It also marks a new era where the Appropriations Committees gradually relinquished their role as budget savers to the Budget Committees and Congress as a whole. Use of these years facilitates annual comparison of budget accounts: five new Army procurement accounts were created in 1972 and two new Navy procurement accounts were created in 1974 (see Table 1). Since 1977 is the first fiscal year to begin on 1 October, we also avoid the problem of annualizing the budget increment for the transition quarter 1976. Yet another consideration is that time periods of obligation were re-established in FY 1971; in the cold war era prior to the DoD Appropriations Act of 1971, there was no time limit for obligating appropriated funds.

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[4]For a listing of all appropriations measures (regular, supplemental, and continuing resolution) for FYs 1981-1988, see *The Federal Budget for 1989,* Hearing before the Committee on Appropriations, House of Representatives, 100th Congress, Second Session, Appendix M.

The data is analyzed in nominal and real dollar increments to avert the possibility that linear incremental results might merely reflect rising prices. On the other hand, only analyzing the data in constant dollars may hide any fiscal illusion phenomena operative on Congressional decision making. Appendix B provides the deflators used for this study. Note the accompanying graph showing the divergence of the *Military Personnel* and *Operation and Maintenance* deflators from the Gross National Product deflator. The complete budgetary data set is provided in Appendices C and D.

B. MEASURES AND CRITERION[5]

Linear regression analysis is a technique used to estimate the value of one quantitative variable by considering its relationship with one or more other quantitative variables. A description or study of the nature of the relationship between variables is called regression analysis, while an investigation of the relative strength of such a relationship is termed correlation analysis.

The simple linear regression model is a mathematical way of stating the statistical relationship between two variables. The two principal elements of this statistical relationship are: (1) the tendency of the *dependent* random variable **Y** (in this study, the percentage increment appropriated) to vary in a systematic way with the *independent* variable **x** (the percentage increment requested), and (2) the scattering of points about the "curve" that represents the relationship between **x** and **Y**. This scattering of points can be

[5]I am indebted to Pfaffenberger (1987) and Giordano (1985) from which portions have been taken directly or adopted from.

the relationship between **x** and **Y**. This scattering of points can be represented on a graph and is called a scatterplot. The systematic way in which the random variable **Y** varies as a function of **x** is identified as a straight line, the regression line of **Y** on **x**.

Our values of **x**, being historical data and reflecting the real world, have the disadvantage of also reflecting the influence of other variables as discussed in Section II-C (Modeling) that are either uncontrollable or not tractable.

The formal statement of the simple linear regression model is given below.

$$\mathbf{Y} = a + b\,\mathbf{x} + e$$

where:

Y = dependent random variable.

a, b = parameters in the regression model.

x = level of the independent variable.

e = random error term.

The two parameters in the simple linear regression model, a and b, are called the regression coefficients, and are estimated from the historical data, using statistical techniques. The coefficient a is called the Y-intercept; it is the value of **Y** (according to the regression line) when $\mathbf{x} = 0$. The coefficient b is the slope of the regression line; its numerical value gives the change in the dependent random variable **Y** (either positive or negative) when there is a one-unit increase in the value of the independent variable, **x**.

One criterion used to find the best-fitting line through the scatter of points is called least squares. The specific values of *a* and *b* that minimize the sum of the squared differences of each observed **y** from its expected value are the regression coefficient estimates. Least squares causes the sum of the residuals to be zero and the sum of the squared differences to be minimized. *PlanPerfect 3.0*[6] was used for the regression analysis in this thesis.

There are various ways to measure budget assertiveness and budget success. The measure chosen for assertiveness in this study is the percentage increment over the base:

$$\frac{\text{Budget Year Budget Request}}{\text{Current Year Current Services Estimate}} \qquad (1)$$

The measure of effectiveness chosen for success is the percentage increment over that same base:

$$\frac{\text{Congressional Appropriation}}{\text{Current Year Current Services Estimate}} \qquad (2)$$

Both of these measures measure the percentage increase (decrease) over a common base, the Current Services Estimate or the "previous year". For clarification, the assertiveness measure for FY 78 is:

$$\frac{\text{FY 78 Request}}{\text{FY 77 Current Services Estimate}}$$

and the success measure for FY 78 is:

$$\frac{\text{FY 78 Appropriation}}{\text{FY 77 Current Services Estimate}}$$

[6]*PlanPerfect 3.0* is spreadsheet software from WordPerfect Corporation, 1555 North Technology Way, Orem, Utah 84057.

The Current Services Estimate is used as the baseline because that is the purpose for which the estimate was designed, as discussed in Section II. Since the Current Services Estimate reflects inflation adjusted program levels, Gramm-Rudman-Hollings sequestrations, and existing authorizing legislation, it can reasonably be considered to reflect current Congressional and Presidential policy.

The use of percentage increments instead of actual increments permit a comparative analysis across accounts.

The criterion for measuring the relationship of budget assertiveness [equation (2)] with budget success [equation (1)] will be the sample coefficient of determination r^2. R^2 measures the strength of a linear relationship between two variables. It is deemed a good criterion because the scatterplots show that a linear relationship may be safely assumed for the range represented by the collected data.

The percentage of the budget request that is appropriated may also be measured and is represented by:

$$\frac{\text{Congressional Appropriation}}{\text{Budget Year Budget Request}} \quad \text{e.g.,} \quad \frac{\text{FY 78 Appropriation}}{\text{FY 78 Budget Request}}$$

Although this reflects the degree to which Congress agrees with the budget request, it is not a good measure of effectiveness in that it does not capture the growth in the agency's base. This measure is calculated and presented with the calculations for equation (1) and (2), for each of the budget accounts analyzed, in Appendices C and D.

IV. STATISTICAL ANALYSIS AND RESULTS

The increments requested and appropriated with respect to the Current Services Estimates baseline are calculated in percentage terms, and are provided in Appendices C and D. The scatterplots for all the budget accounts suggest the reasonableness of fitting a linear model to the data. Plots of the estimated residuals against the independent variable show no autocorrelation (Ostrom 1978, p. 12). Graphs comparing the measures for all budget accounts are shown in Appendix E.

Unless otherwise specified, discussion of all results is based on the data after adjusting for inflation. A t-ratio test was applied to all regression results showing the **x** coefficient to be significant at the 90% probability level for all accounts, except *RDT&E, Army,* and significant for all accounts at the 80% probability level.

Tables 4 and 5 show the budget accounts ranked by the coefficient of determination r^2. This shows the order of the accounts in which assertiveness best explains the percentage increment appropriated, when using nominal dollars and constant dollars respectively. Table 6 shows the budget accounts in Table 5 (constant dollars) rearranged and ranked within each appropriation for the convenience of the reader.

There is no correlation between the number of times the President's Budget is amended (see Table 3) and the r^2s in Table 5 (the calculated r^2 for this relationship was 0.00).

TABLE 4

RANKING OF BUDGET ACCOUNTS BY R^2
(NOMINAL DOLLARS)

Procurement, Marine Corps	0.9766
Other Procurement, Air Force	0.9613
Military Personnel, Army	0.9612
Other Procurement, Army	0.9508
Military Personnel, Marine Corps	0.9487
Military Personnel, Air Force	0.9486
Military Personnel, Navy	0.9318
Operation and Maintenance, Army	0.9246
Aircraft Procurement, Army	0.9035
Operation and Maintenance, Navy	0.8947
Operation and Maintenance, Marine Corps	0.8933
Procurement of Weapons and Tracked Combat Vehicles, Army	0.8780
Other Procurement, Navy	0.8742
Aircraft Procurement, Air Force	0.8579
Operation and Maintenance, Air Force	0.8377
Procurement of Ammunition, Army	0.8249
Missile Procurement, Army	0.8049
Research, Development, Test, and Evaluation, Navy	0.7608
Research, Development, Test, and Evaluation, Air Force	0.7333
Shipbuilding and Conversion, Navy	0.7150
Missile Procurement, Air Force	0.6741
Aircraft Procurement, Navy	0.6020
Weapons Procurement, Navy	0.3768
Research, Development, Test, and Evaluation, Army	0.0416

TABLE 5

RANKING OF BUDGET ACCOUNTS BY R^2
(CONSTANT DOLLARS)

Procurement, Marine Corps	0.9771
Military Personnel, Army	0.9619
Other Procurement, Air Force	0.9579
Military Personnel, Marine Corps	0.9530
Military Personnel, Air Force	0.9516
Other Procurement, Army	0.9416
Military Personnel, Navy	0.9400
Operation and Maintenance, Marine Corps	0.9101
Operation and Maintenance, Army	0.9007
Aircraft Procurement, Army	0.9004
Other Procurement, Navy	0.8885
Procurement of Weapons and Tracked Combat Vehicles, Army	0.8562
Aircraft Procurement, Air Force	0.8455
Research, Development, Test, and Evaluation, Navy	0.8264
Procurement of Ammunition, Army	0.8220
Operation and Maintenance, Navy	0.8101
Missile Procurement, Army	0.7788
Shipbuilding and Conversion, Navy	0.7100
Operation and Maintenance, Air Force	0.7062
Research, Development, Test, and Evaluation, Air Force	0.6872
Missile Procurement, Air Force	0.6643
Aircraft Procurement, Navy	0.5625
Weapons Procurement, Navy	0.4749
Research, Development, Test, and Evaluation, Army	0.2576

TABLE 6

RANKING OF BUDGET ACCOUNTS BY R^2 BY APPROPRIATION (CONSTANT DOLLARS)

MILITARY PERSONNEL	
Military Personnel, Army	0.9619
Military Personnel, Marine Corps	0.9530
Military Personnel, Air Force	0.9516
Military Personnel, Navy	0.9400
OPERATION AND MAINTENANCE	
Operation and Maintenance, Marine Corps	0.9101
Operation and Maintenance, Army	0.9007
Operation and Maintenance, Navy	0.8101
Operation and Maintenance, Air Force	0.7062
PROCUREMENT	
Procurement, Marine Corps	0.9771
Other Procurement, Air Force	0.9579
Other Procurement, Army	0.9416
Aircraft Procurement, Army	0.9004
Other Procurement, Navy	0.8885
Procurement of Weapons and Tracked Combat Vehicles, Army	0.8562
Aircraft Procurement, Air Force	0.8455
Procurement of Ammunition, Army	0.8220
Missile Procurement, Army	0.7788
Shipbuilding and Conversion, Navy	0.7100
Missile Procurement, Air Force	0.6643
Aircraft Procurement, Navy	0.5625
Weapons Procurement, Navy	0.4749
RESEARCH, DEVELOPMENT, TEST, AND EVALUATION	
Research, Development, Test, and Evaluation, Navy	0.8264
Research, Development, Test, and Evaluation, Air Force	0.6872
Research, Development, Test, and Evaluation, Army	0.2576

Figures 1 through 5 show graphical comparisons of budget assertiveness and success across the services. The services seem to be most synchronized with regard to *Military Personnel*.

Of the four services, the Navy generally has the lowest r^2s. This is an interesting finding in view of a related finding by Lukenas (1974) that the Navy is the service most affected in terms of the number of decisions and dollar amounts of reductions by the House Defense Appropriations Subcommittee for the fiscal years 1970-1973. Lukenas also found the Marine Corps to be the least affected.

Procurement, Marine Corps performs the best with regard to budget assertiveness. The other Marine Corps accounts are ranked either first or second in the other appropriations. This suggests corroboration of a general appreciation that the Marine Corps has powerful friends in Congress.

The *Military Personnel* accounts seem to perform well and the following reasons are suggested: (1) although Congress theoretically has the incentive to cut manpower first because the effects are not concentrated in any one district, it does not do so, perhaps because of the voting power of the military, or the recognition that cuts in this title create an exodus of trained personnel; (2) *Military Personnel* has the highest first year outlay rate (98%) and the highest reprogramming threshold ($10,000,000)--indicating perhaps a high level of confidence by the Congress with DoD handling of this account; (3) a high proportion of the *Military Personnel* and *Operation and Maintenance* titles is

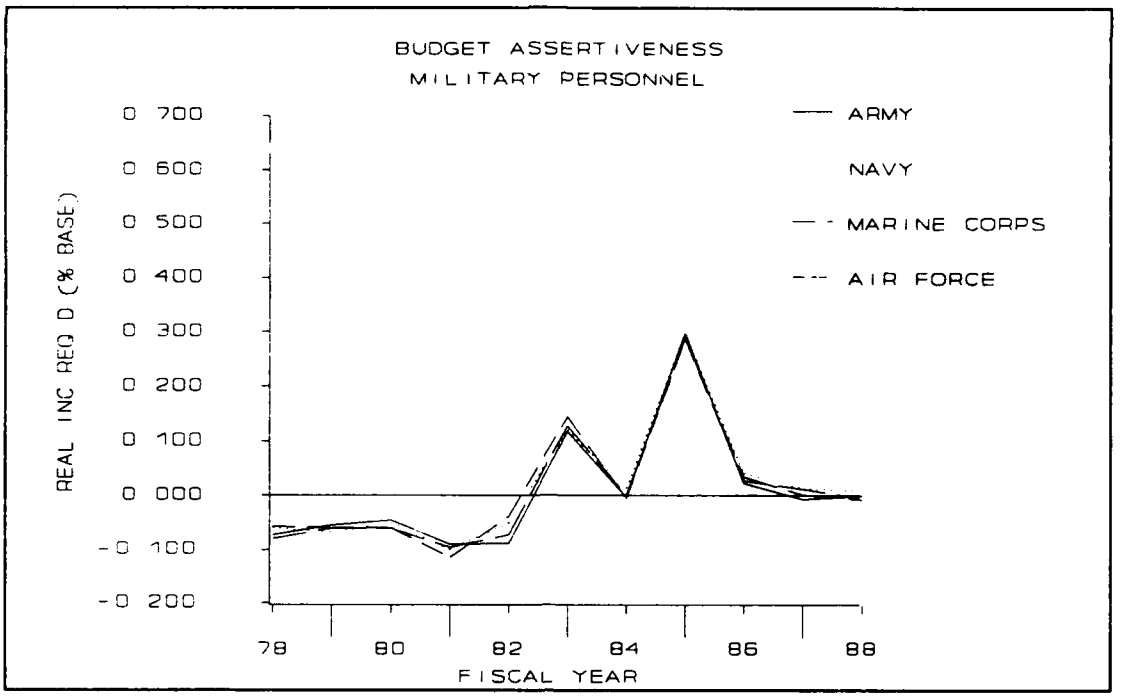

Figure 1 (a)

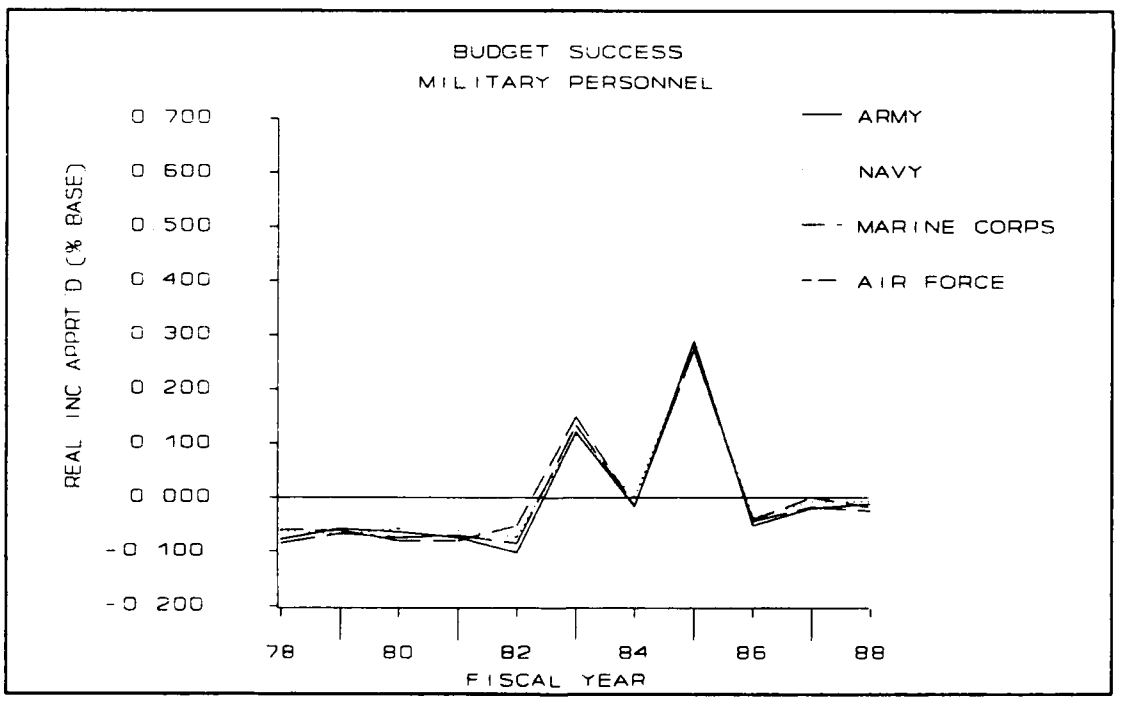

Figure 1 (b)

Budget Assertiveness vs Budget Success: Military Personnel

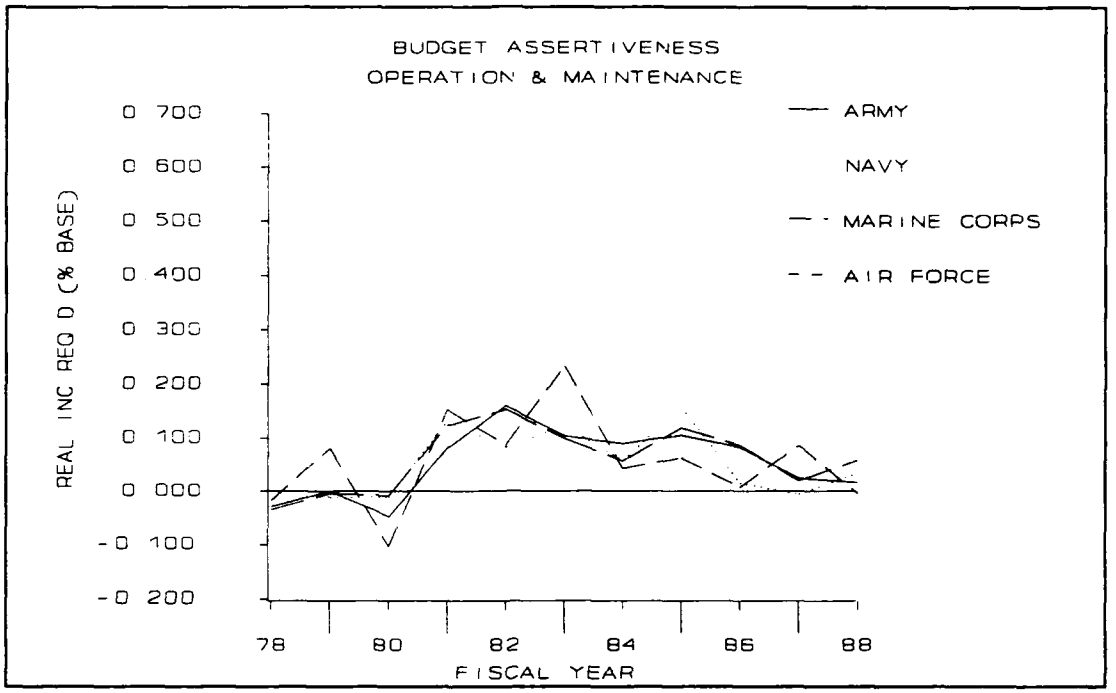

Figure 2 (a)

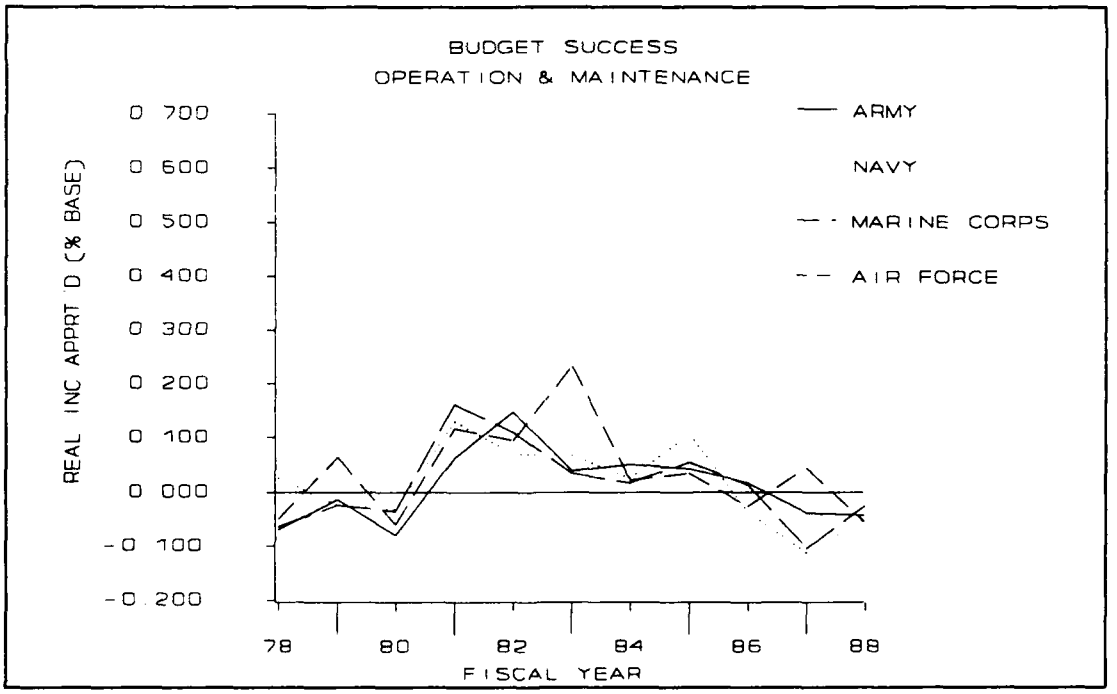

Figure 2 (b)

Budget Assertiveness vs Budget Success: Operation & Maintenance

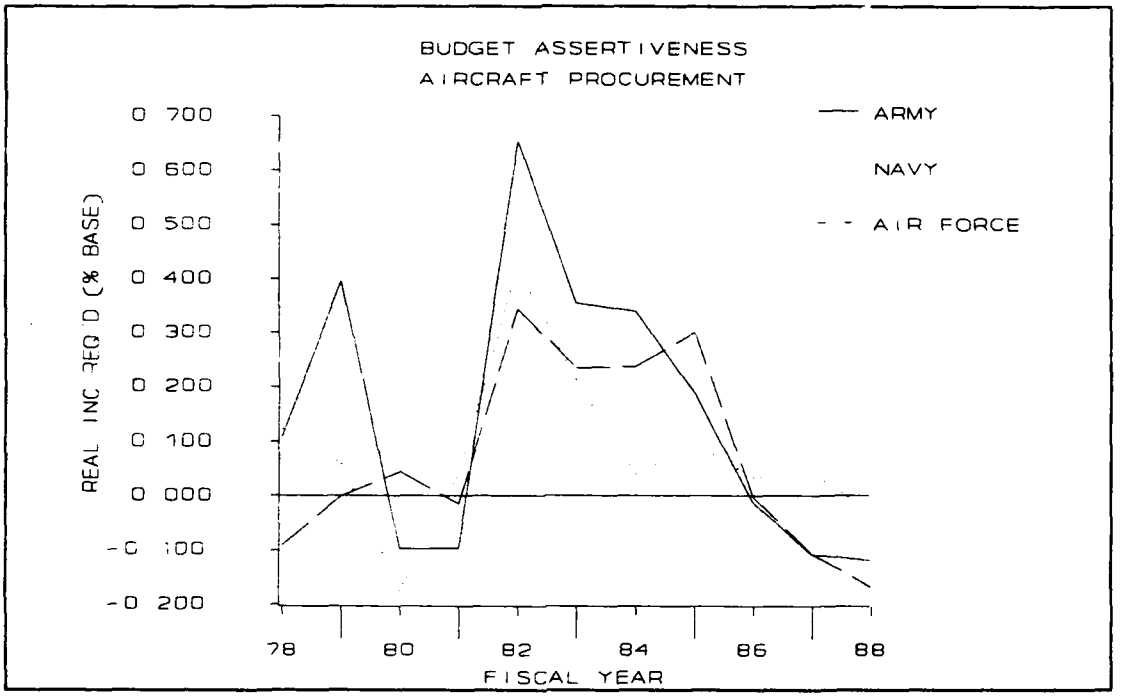

Figure 3 (a)

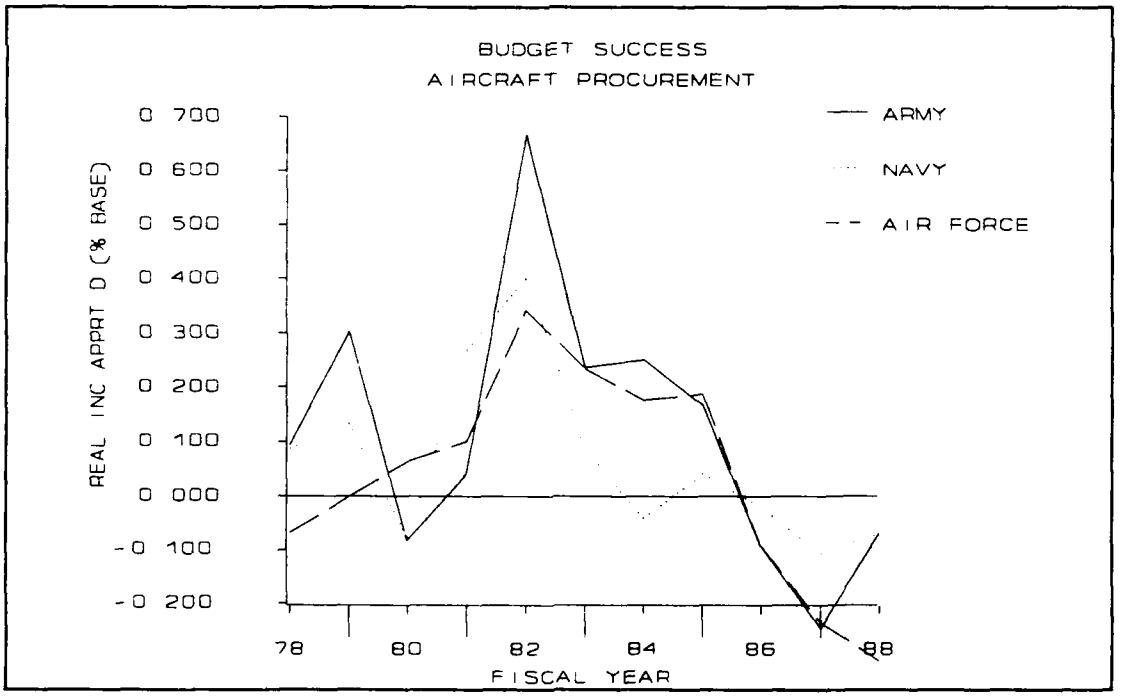

Figure 3 (b)

Budget Assertiveness vs Budget Success: Aircraft Procurement

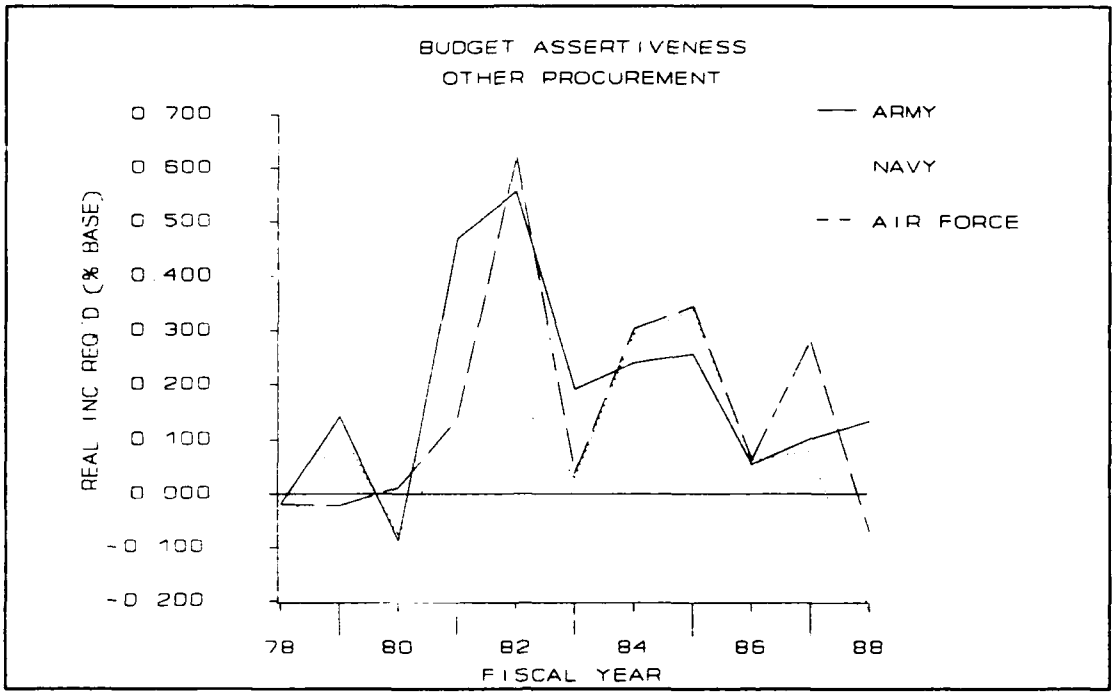

Figure 4 (a)

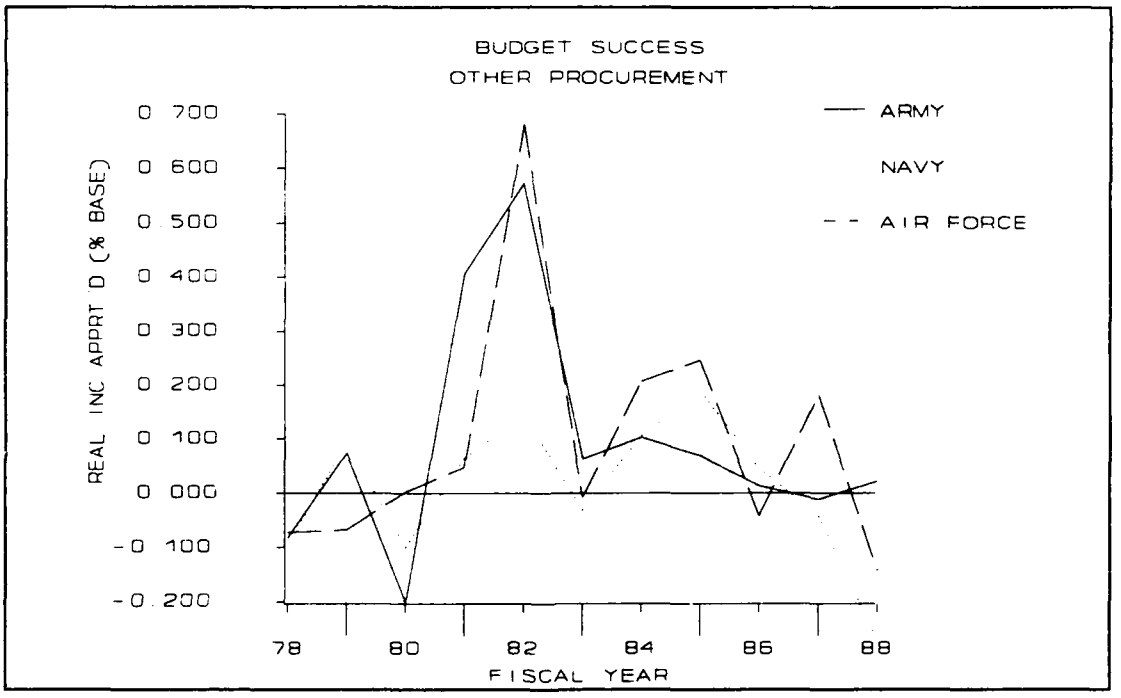

Figure 4 (b)

Budget Assertiveness vs Budget Success: Other Procurement

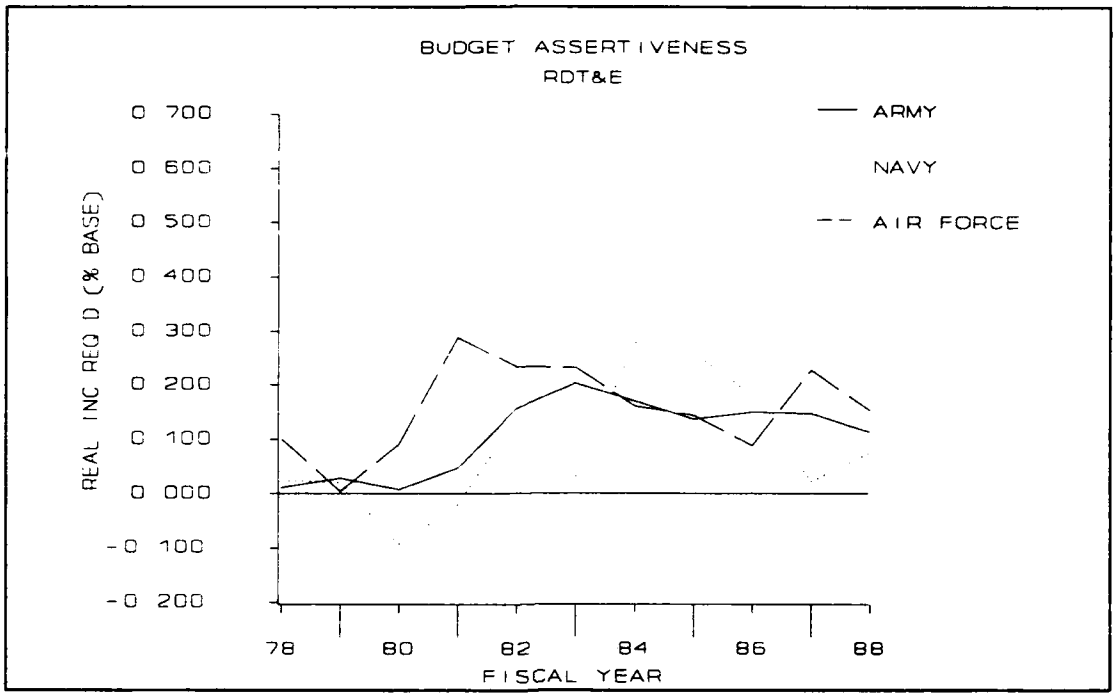

Figure 5 (a)

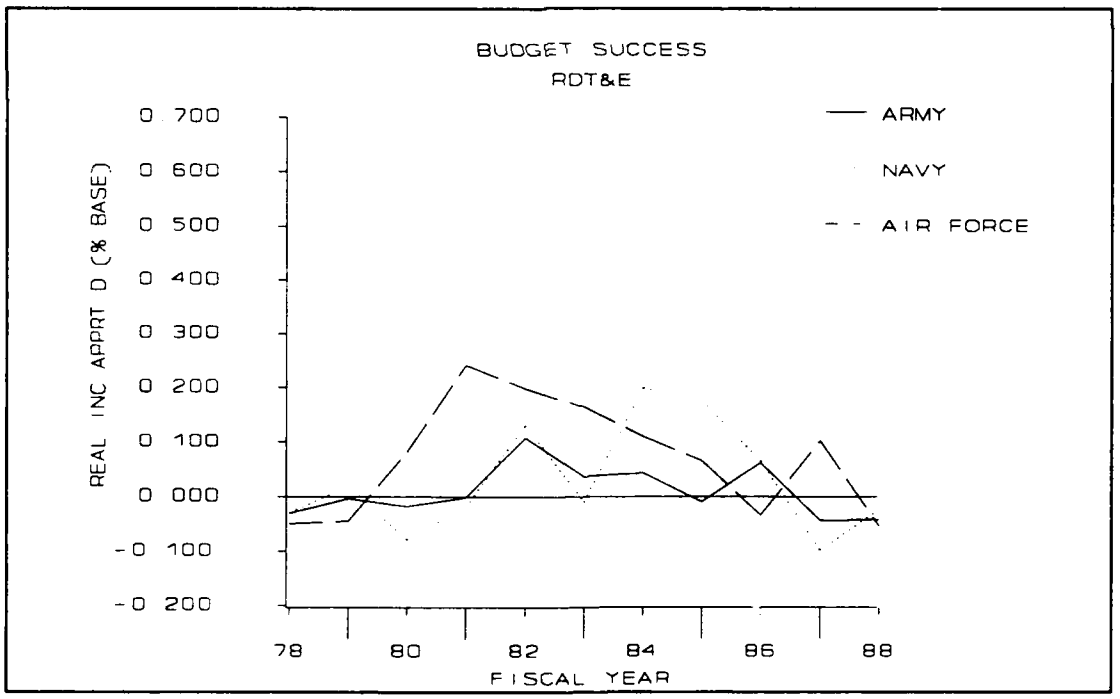

Figure 5 (b)

Budget Assertiveness vs Budget Success: RDT&E

appropriated under a continuing authorization vice an annual authorization; (4) the *Military Personnel* appropriation has the lowest topline budget turbulence among the four major defense appropriations[7]; and (5) the "riskier" or debatable portion of the *Military Personnel* appropriation, pay raises, is enacted separately in a supplemental appropriation.

The *Civilian and Military Pay Raises* account was created to implement section 9094 of the DoD Appropriations Act, 1987, as included in PL 99-500 and 99-591, section 101(c), and section 8139 of the DoD Appropriations Act, 1988. It involved the appropriation and complete transfer to *Military Personnel* and *Operation and Maintenance* of 1.911 billion and 875 million dollars in fiscal years 1987 and 1988, respectively. These statutes provided:

> ... that such sums as may be necessary for authorized pay raise costs in excess of [this] appropriation shall be accommodated within the levels appropriated in [this] Act.

Pay raises are typically an area for disagreement between the President and the Congress. Non-DoD and DoD civilians all get the same pay raise; coordinating a to-be-determined pay raise within the 13 regular appropriation bills would delay the budgeting process. Additionally, the amount of the military pay raise is usually equal to that of the civilian pay raise. For the period 1977 - 1988, this was so except for FYs 1980, 1981, and 1985. Hence, it is the convention that pay raises are not requested in

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[7]Topline budget turbulence is defined as the annual variations about the long-term mean level of funding actually appropriated by Congress. See Defense Systems Management College, Strategies for Dealing with the Defense Budget, 1983.

the regular budget submission, but are arranged through a Supplemental. Mintz (1988, p. 89) found the average increase in military basic pay to be much higher in election year budgets.

In the *Procurement* appropriation, we see that the *Other Procurement* accounts do best while *Missile* and *Weapons* procurement do the worst. The *Procurement Marine Corps* account does not suffer this fate possibly because it has no strategic weapons programs and hence avoids political controversy in this realm.

Generally, *RDT&E* had lower r^2s. This may be due to the tendency of recent DoD budgets to hold *RDT&E* to a ten percent relative share of the overall DoD budget. The analysis implies *RDT&E* could have been larger in several of the years studied had DoD requested larger *RDT&E* increments.

The only notable shift in the rankings of r^2 when analyzing nominal vs constant dollars was a moderate drop in the ranking of *Operation and Maintenance, Navy*, and *Operation and Maintenance, Air Force* when calculated using constant dollars. Fuel is a significant component of these two accounts and its price has varied widely over the years studied. This suggests that *O&M* accounts are penalized by the uncertainties of inflation budgeting, e.g. for fuel.

Since there is no otherwise significant shifting of relative rankings among the r^2s when comparing nominal versus real increments, we can perhaps deduce that a fiscal illusion does not operate on Congressional decision making.

A cross-sectional analysis was performed on the budgetary data. The results are provided in Table 7. The significantly high r^2 for FY 1982 perhaps reflects President Reagan's mandate to increase defense spending and Congressional acquiescence during the honeymoon. The low r^2 for FY 1988 may reflect the effects of the 20 November 1987 budget summit between the President and Congressional leaders that provided a compromise between defense and non-defense spending. This budget agreement consequently led to a "top-down" budget reformulation/execution for FY 88 and would mitigate any assertiveness originally represented in the data. It will be interesting to note if this represents a trend. The r^2s may also be correlated with public opinion or electoral cycles, and if so, would cause us to refine our model.

TABLE 7

CROSS-SECTIONAL ANALYSIS OF BUDGET ASSERTIVENESS VS BUDGET SUCCESS

FY	R^2	RANGE REQ'D	RANGE APPRT'D
1978	.8008	0.429	0.382
1979	.9088	0.661	0.716
1980	.9192	0.814	0.880
1981	.7534	1.155	0.658
1982	.9933	2.436	2.404
1983	.7676	1.031	0.920
1984	.9250	0.823	0.849
1985	.7020	0.286	0.377
1986	.5732	0.378	0.251
1987	.8063	0.475	0.472
1988	.2878	0.385	0.886

Table 8 provides the model equations derived from the regression analysis for the user to predict Congressional response to a budget

account within the President's Budget. These equations should not be used until the user has calculated the increment in real terms. The model will provide the expected real increment Congress will appropriate. Intervals for a 80% confidence level are also provided, using a t-distribution with 9 degrees of freedom.

Table 9 provides the real increment (decrement) the model predicts each budget account would receive if only a zero real growth budget were requested. Statistically speaking, it is merely a table of the regression equation constants, or the Y-intercepts when the independent variable $x = 0$. This thesis does not mean to imply that an overall zero real growth defense budget request would result in a real cut. The table attempts to show that, in isolation, each account would experience varying percentage cuts. The size of the predicted decrements does show the relative importance of requesting a budget increase in order to avoid a cut. Note that it is predicted that all accounts would experience a real cut except for *Aircraft Procurement, Navy (APN)*, and *Shipbuilding and Conversion, Navy (SCN)*. These two accounts, along with *Weapons Procurement, Navy (WPN)* have the largest regression constants within the *Procurement* title. This could suggest the relatively strong influence of naval weapons systems contractors on Congress viz a viz other defense contractors or the incessant will of Secretary John Lehman.

Table 10 shows the results of a multiple regression using both the base and the increment requested, in real dollar amounts, as independent variables. The model is as follows:

$$Y = a + b x_1 + c x_2$$

where x_1 = the base or current services estimate
x_2 = the amount of the increment requested

This regression analysis permits us to analyze the extent to which the "base" is protected in each of the various accounts, and what percentage of the increment requested is appropriated, by observing the values of the coefficients. For the base to be inviolate, we would expect the x_1 coefficient to approach one (1.000). (Wanat 1974)

The top ranking of the three Marine Corps accounts again corroborates the friendship and respect experienced between the Marine Corps and the Congress. The *Procurement, Marine Corps* account takes top ranking perhaps because controversial advanced technology hardware is introduced later into the Corps than it is for the other services. The strong standing of the Marine Corps baseline may also reflect Congressional sentiment that there is less fat in these accounts.[6]

Again, we see the base for missile procurement accounts to be more vulnerable than other accounts, perhaps illustrating the political risk inherent in strategic weapons programs.

The tendency for the higher coefficients of the increment variable to be in the operation and support accounts (*O&M, Ammunition,* and *Personnel*) perhaps illustrates the "get it while you can" philosophy.

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[6]The author cannot recall a spare parts "horror story" involving the Marine Corps.

TABLE 8

BUDGET ACCOUNT MODELS

ACCOUNT	MODEL	CONFIDENCE INTERVAL
MILITARY PERSONNEL		
MPA	Y = -0.0124 + 0.9864 X	[0.90,1.08]
MPN	Y = -0.0120 + 0.9194 X	[0.81,1.03]
MPMC	Y = -0.0096 + 0.9600 X	[0.86,1.06]
MPAF	Y = -0.0132 + 0.9568 X	[0.86,1.06]
OPERATION AND MAINTENANCE		
OMA	Y = -0.0419 + 0.9948 X	[0.84,1.15]
OMN	Y = -0.0456 + 1.1054 X	[0.81,1.35]
OMMC	Y = -0.0154 + 0.9441 X	[0.81,1.08]
OMAF	Y = -0.0502 + 1.0463 X	[0.74,1.36]
PROCUREMENT		
APA	Y = -0.0175 + 0.9098 X	[0.77,1.05]
MPrA	Y = -0.0460 + 0.8217 X	[0.62,1.03]
PWA	Y = -0.0770 + 1.0276 X	[0.83,1.22]
PAA	Y = -0.0647 + 1.1403 X	[0.90,1.38]
OPA	Y = -0.1093 + 1.0925 X	[0.97,1.22]
APN	Y = 0.0014 + 0.7969 X	[0.47,1.12]
WPN	Y = -0.0077 + 0.7859 X	[0.40,1.17]
SCN	Y = 0.0159 + 0.8578 X	[0.61,1.11]
OPN	Y = -0.0502 + 0.7681 X	[0.64,0.89]
PMC	Y = -0.0800 + 0.9541 X	[0.89,1.02]
APAF	Y = -0.0372 + 1.0382 X	[0.83,1.24]
MPrAF	Y = -0.1001 + 0.9247 X	[0.62,1.23]
OPAF	Y = -0.0716 + 1.0745 X	[0.97,1.18]
RESEARCH, DEVELOPMENT, TEST, AND EVALUATION		
RDTE,A	Y = -0.0277 + 0.3464 X	[0.08,0.62]
RDTE,N	Y = -0.0344 + 0.7747 X	[0.61,0.94]
RDTE,AF	Y = -0.0920 + 1.0421 X	[0.72,1.37]

TABLE 9

PREDICTED CHANGE IN BUDGET ACCOUNTS FOR A ZERO REAL GROWTH REQUEST

MILITARY PERSONNEL	
Military Personnel, Army	- 1.2%
Military Personnel, Navy	- 1.2%
Military Personnel, Marine Corps	- 1.0%
Military Personnel, Air Force	- 1.3%
OPERATION AND MAINTENANCE	
Operation and Maintenance, Army	- 4.2%
Operation and Maintenance, Navy	- 4.6%
Operation and Maintenance, Marine Corps	- 1.5%
Operation and Maintenance, Air Force	- 5.0%
PROCUREMENT	
Aircraft Procurement, Army	- 1.8%
Missile Procurement, Army	- 4.6%
Procurement of Weapons and Tracked Combat Vehicles, Army	- 7.7%
Procurement of Ammunition, Army	- 6.5%
Other Procurement, Army	-10.9%
Aircraft Procurement, Navy	1.4%
Weapons Procurement, Navy	- 0.8%
Shipbuilding and Conversion, Navy	1.6%
Other Procurement, Navy	- 5.0%
Procurement, Marine Corps	- 8.0%
Aircraft Procurement, Air Force	- 3.7%
Missile Procurement, Air Force	-10.0%
Other Procurement, Air Force	- 7.2%
RESEARCH, DEVELOPMENT, TEST, AND EVALUATION	
Research, Development, Test, and Evaluation, Army	- 2.8%
Research, Development, Test, and Evaluation, Navy	- 3.4%
Research, Development, Test, and Evaluation, Air Force	- 9.2%

TABLE 10

RANKING BY COEFFICIENTS OF THE "BASE"

ACCOUNT	COEFFICIENT BASE	COEFFICIENT INCREMENT
OMMC	0.9133	0.9780
PMC	0.9124	0.9357
MPMC	0.9113	0.9635
MPA	0.8987	0.9733
MPN	0.8960	0.9318
MPAF	0.8875	0.9502
APA	0.8817	0.9325
PWA	0.8566	0.9896
OPAF	0.8551	0.9868
OMA	0.8541	1.0265
OPN	0.8525	0.7608
OPA	0.8404	0.9523
OMN	0.7949	1.1224
MPrA	0.7906	0.8911
RDTE,AF	0.7762	1.1152
APAF	0.7701	1.0875
APN	0.7405	0.8414
WPN	0.7397	1.0030
PAA	0.7373	1.0059
RDTE,N	0.7322	0.8835
MPrAF	0.7094	0.9669
OMAF	0.6981	1.2313
SCN	0.6500	0.7562
RDTE,A	0.5261	0.6316

This thesis suggests an agency should seek Congressional funds aggressively but always with sufficient justification so as to avoid damage to the agency's credibility with regard to budget estimates (Wildavsky 1988). The bounds of assertiveness are suggested by Tables 11 and 12.

The degree to which observed data is distributed on a scale can be measured by special statistics. The simplest measure of dispersion is called the range, which measures the difference

TABLE 11

SUGGESTED UPPER BOUNDS FOR ASSERTIVENESS

MILITARY PERSONNEL	
Military Personnel, Army	0%
Military Personnel, Navy	1%
Military Personnel, Marine Corps	1%
Military Personnel, Air Force	0%
OPERATION AND MAINTENANCE	
Operation and Maintenance, Army	9%
Operation and Maintenance, Navy	8%
Operation and Maintenance, Marine Corps	9%
Operation and Maintenance, Air Force	12%
PROCUREMENT	
Aircraft Procurement, Army	34%
Missile Procurement, Army	30%
Procurement of Weapons and Tracked Combat Vehicles, Army	24%
Procurement of Ammunition, Army	35%
Other Procurement, Army	24%
Aircraft Procurement, Navy	6%
Weapons Procurement, Navy	20%
Shipbuilding and Conversion, Navy	5%
Other Procurement, Navy	29%
Procurement, Marine Corps	31%
Aircraft Procurement, Air Force	30%
Missile Procurement, Air Force	30%
Other Procurement, Air Force	30%
RESEARCH, DEVELOPMENT, TEST, AND EVALUATION	
Research, Development, Test, and Evaluation, Army	17%
Research, Development, Test, and Evaluation, Navy	14%
Research, Development, Test, and Evaluation, Air Force	23%

TABLE 12

BUDGET ACCOUNTS RANKED BY INTERQUARTILE RANGES

	IQR* BY % INCREMENT REQUESTED			IQR** BY % INCREMENT APPRT'D	
	INTER-QUARTILE RANGE	ASSOC APPRT'D RANGE		INTER-QUARTILE RANGE	ASSOC REQ'D RANGE
APA	.452	.344	SCN	.726	.367
PMC	.429	.480	PMC	.480	.429
SCN	.367	.726	MPrAF	.437	.321
APAF	.329	.326	PAA	.344	.385
OPAF	.323	.280	APA	.333	.474
MPrA	.286	.396	APAF	.281	.392
MPrAF	.280	.477	OPAF	.275	.326
PAA	.272	.443	PWA	.263	.323
PWA	.263	.395	MPrA	.239	.463
OPN	.258	.247	RDTE,AF	.209	.229
OPA	.201	.114	APN	.203	.239
RDTE,N	.160	.228	OPN	.202	.376
RDTE,AF	.143	.218	RDTE,N	.160	.200
OMN	.128	.182	OMMC	.144	.104
RDTE,A	.128	.151	WPN	.122	.148
OMAF	.123	.159	OPA	.114	.201
MPAF	.107	.069	OMN	.107	.133
OMA	.103	.105	OMA	.093	.104
MPN	.102	.073	OMAF	.090	.126
MPA	.095	.066	RDTE,A	.073	.196
WPN	.093	.303	MPN	.063	.141
APN	.091	.378	MPA	.062	.112
OMMC	.091	.151	MPMC	.060	.087
MPMC	.087	.060	MPAF	.058	.130

*The first column of numbers is the IQR for the increment percentages requested for each account; the second column is the range of increment percentages appropriated (the seven observations but not the IQR) that is associated with the increment percentages requested IQR.

**The first column of numbers is the IQR for the increment percentages appropriated for each account; the second column is the range of increment percentages requested (the seven observations but not the IQR) that is associated with the increment percentages appropriated IQR.

between the largest and smallest observation. The interquartile range (IQR) measures the dispersion between, not the extremes, but the 25th and 75th percentile.[9] The larger the range, or interquartile range, is for a data set, the more variable (spread out) the set of measurements is. (Bohrnstedt 1988)

Tables 11 and 12 utilize the interquartile range so as to eliminate the unusual budgeting consequences of, say, an ideological change in administrations, or a large one-time increment of a two-aircraft carrier acquisition. Use of interquartile ranges is also implied for those analysts who, while accepting the "assertiveness" theory, are still more comfortable submitting "realistic" budgets, thereby combining the two theories. Table 11 is constructed by taking the requested increment associated with the upper bound of the interquartile range (the 75th percentile) of increments appropriated. In other words, using the interquartile range, the highest appropriation increment was attained when this increment (real) was requested, for the Fiscal Years 1978 - 1988. Table 12 shows the degree to which requested increments and appropriated increments have varied.

Finally, Table 13 shows both measures of success, averaged for the fiscal years studied: 1) the percentage of the account's budget request appropriated, and 2) the percentage real increment appropriated (or annual growth). Similar to Fenno's finding, we found no correlation (r^2 = .111) between the two measures. If we use the average absolute increment appropriated, we also see no

[9]See Glossary for an expanded explanation.

correlation (r^2 = .022). In contrast, the correlation between the average percentage increment requested with the average percentage increment appropriated is high (r^2 = .821). The r^2 using average absolute increment percentages requested and appropriated is .890. A budget analyst might want to use both measures to capture different dimensions of DoD budgeting.

We note that the three Marine Corps accounts each lead their appropriations title with regard to average annual budget growth but not so when measuring the average percentage of their budget request Congress appropriated.

TABLE 13

BUDGET ACCOUNT MEASURES OF SUCCESS

	AVERAGE PERCENTAGE REQUEST APPROPRIATED		AVERAGE PERCENTAGE REAL INCREMENT APPROPRIATED
MPA	98.8%	MPA	- 0.6%
MPN	98.8%	MPN	0.2%
MPMC	99.1%	MPMC	0.2%
MPAF	98.7%	MPAF	- 0.7%
OMA	96.0%	OMA	1.1%
OMN	96.2%	OMN	1.6%
OMMC	98.3%	OMMC	3.8%
OMAF	95.5%	OMAF	1.3%
APA	97.7%	APA	11.5%
MPrA	93.8%	MPrA	10.3%
PWA	93.3%	PWA	5.3%
PAA	95.0%	PAA	4.8%
OPA	91.9%	OPA	9.3%
APN	99.0%	APN	6.4%
WPN	97.9%	WPN	5.4%
SCN	100.6%	SCN	10.7%
OPN	94.0%	OPN	1.0%
PMC	93.0%	PMC	19.0%
APAF	96.5%	APAF	3.6%
MPrAF	90.4%	MPrAF	10.7%
OPAF	94.5%	OPAF	9.4%
RDTE,A	91.4%	RDTE,A	0.9%
RDTE,N	95.3%	RDTE,N	3.0%
RDTE,AF	92.6%	RDTE,AF	7.1%

V. CONCLUSIONS

This thesis shows a significant degree of correlation between budget assertiveness and budget success for most all the accounts analyzed. The Marine Corps has a special propensity for achieving budget success.

Generally, the "he who asks for more, gets more" rule applies. Separate models--all linear--have been presented for the reader to predict future near term Congressional appropriations.

This thesis suggests that Operation and Maintenance accounts are marked by cost uncertainties or risks. Similarly, procurement of strategic weapons is marked by political risks, and RDT&E is marked by technological risk.

The reader should be aware of the following pitfalls when adopting this thesis for his personal budget strategy:

(1) The model used in this thesis, budget success = f(budget assertiveness), is a simple one, and was applied to each account individually. However, the individual budget accounts are not independent of each other. Intense assertiveness in one account or in one service may have a debilitating effect on other accounts or services.

(2) The data comprises specific Administration budgeting (Ford, Carter, and Reagan) and specific Congress legislating (the 95th through 100th) and is not necessarily predictive for a different

President and/or a different Congress. Specifically, the following players will have changed when Congress considers the FY 90 budget:

- President
- Secretary of Defense
- Senate Majority Leader
- Chairman, Senate Appropriations Committee
- Chairman, Senate Budget Committee
- Chairman, House Budget Committee
- Chairman, Defense Subcommittee, House Appropriations
- Director, Office of Management and Budget
- Director, Congressional Budget Office

(3) The seeming comity of Congress with DoD assertiveness may be spurious and merely reflect a common recognition of the need to match defense spending with an increased citizen preference or an increased threat.

Comptrollers and agency heads should not be concerned with presenting what some may perceive as unreasonable budget requests. Assertive budget requests, properly justified, provide budget reviewers a better means by which to judge the value of one program's increment versus another. The struggle for limited defense funds must be intensified, not mitigated, to ensure funding of the most productive programs.

VI. RECOMMENDATIONS FOR FURTHER STUDY

It would be worth investigating further the reasons for the apparent budget success experienced by the Marine Corps as delineated in this study, with a view towards applying those findings throughout the Department of Defense. One could also study the budgetary success regarding Marine Corps aircraft, amphibious assault ships, and other weapons systems procured for the Marine Corps by other services.

Since a significant proportion of funding changes to the President's Budget are currently initiated in the Authorizations Committee, one could study the implications for defense budgeting from a merger of the Authorization and Appropriations committees; or with the Budget Committee becoming a subcommittee within the Appropriations Committee. One could also explore the degree to which the convention that Appropriations bills originate in the House is being disregarded.

Also meriting further investigation would be a refinement of the model presented in this thesis to include some of the variables listed in Section II-C. For example, among major weapon systems programs, the researcher could investigate to what degree the reputation and expertise level of the program manager influences the appropriation of funds. In the context of end-of-year spending criticism, it would be interesting to explore the correlation between account lapses, reprogrammings, and transfers, and future budget success.

APPENDIX A

LEGAL ENVIRONMENT OF DEPARTMENT OF DEFENSE BUDGETING

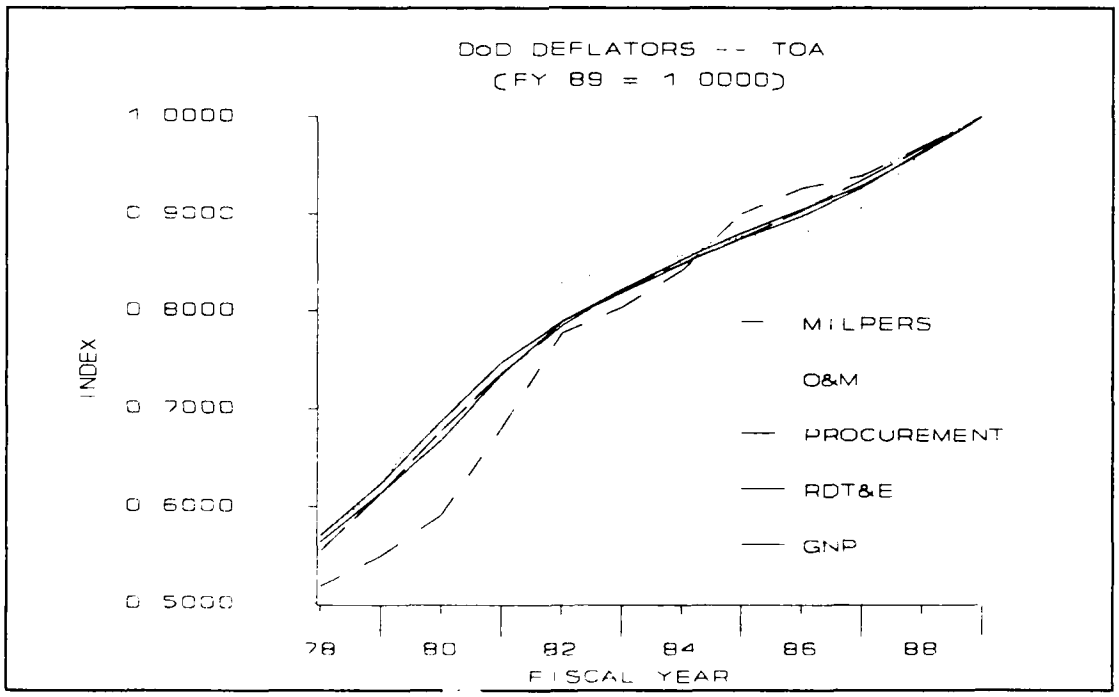
22 Sep 76	PL 94-419	DoD Appropriations Act, 1977
21 Sep 77	PL 95-111	DoD Appropriations Act, 1978
13 Oct 78	PL 95-457	DoD Appropriations Act, 1979
21 Dec 79	PL 96-154	DoD Appropriations Act, 1980
15 Dec 80	PL 96-527	DoD Appropriations Act, 1981
29 Dec 81	PL 97-114	DoD Appropriations Act, 1982
21 Dec 82	PL 97-377	DoD Appropriations Act, 1983
08 Dec 83	PL 98-212	DoD Appropriations Act, 1984
12 Oct 84	PL 98-473	DoD Appropriations Act, 1985
19 Dec 85	PL 99-190	DoD Appropriations Act, 1986
18 Oct 86	PL 99-500	DoD Appropriations Act, 1987; and
	PL 99-591	DoD Appropriations Act, 1987
22 Dec 87	PL 100-202	DoD Appropriations Act, 1988
14 Jul 76	PL 94-361	DoD Authorization Act, 1977
30 Jul 77	PL 95- 79	DoD Authorization Act, 1978
20 Oct 78	PL 95-485	DoD Authorization Act, 1979
09 Nov 79	PL 96-107	DoD Authorization Act, 1980
08 Sep 80	PL 96-342	DoD Authorization Act, 1981
23 Nov 81	PL 97- 86	DoD Authorization Act, 1982
08 Sep 82	PL 97-252	DoD Authorization Act, 1983
24 Sep 83	PL 98- 94	DoD Authorization Act, 1984
19 Oct 84	PL 98-525	DoD Authorization Act, 1985
08 Nov 85	PL 99-145	DoD Authorization Act, 1986
14 Dec 86	PL 99-661	DoD Authorization Act, 1987
04 Dec 87	PL 100-180	DoD Authorization Act, 1988
12 Jul 74	PL 93-344	Congressional Budget and Impoundment Control Act of 1974
12 Dec 85	PL 99-177	Balanced Budget and Emergency Deficit Control Act of 1985 (Gramm-Rudman-Hollings)
30 Sep 87	PL 100-119	Balanced Budget and Emergency Deficit Control Reaffirmation Act of 1987

APPENDIX B

DEPARTMENT OF DEFENSE DEFLATORS - TOA

FY	MILPERS	O & M	PRCRMT	RDT&E	GNP
77	0.4847	0.5291	0.5048	0.5269	0.5283
78	0.5178	0.5706	0.5551	0.5701	0.5642
79	0.5498	0.6191	0.6136	0.6238	0.6139
80	0.5912	0.7179	0.6775	0.6877	0.6679
81	0.6803	0.7884	0.7364	0.7470	0.7347
82	0.7762	0.8284	0.7841	0.7889	0.7883
83	0.8033	0.8447	0.8209	0.8182	0.8215
84	0.8413	0.8570	0.8484	0.8481	0.8527
85	0.9003	0.8769	0.8745	0.8741	0.8800
86	0.9269	0.8795	0.9030	0.8977	0.9046
87	0.9397	0.9065	0.9350	0.9276	0.9290
88	0.9695	0.9651	0.9684	0.9648	0.9634
89	1.0000	1.0000	1.0000	1.0000	1.0000
90	1.0442	1.0339	1.0293	1.0338	1.0360
91	1.0892	1.0669	1.0558	1.0649	1.0702

Source: *National Defense Budget Estimates for FY 1988/1989*, Office of the Assistant Secretary of Defense (Comptroller), April 1988.



APPENDIX C

BUDGETARY DATA SET (NOMINAL DOLLARS)

MILITARY PERSONNEL, ARMY
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	8,870,000	8,682,166	8,564,011			
78	9,144,600	8,790,943	8,741,800	99.44%	-0.009	-0.014
79	9,594,700	9,180,000	9,154,325	99.72%	0.004	0.001
80	10,376,019	9,848,900	9,668,819	98.17%	0.026	0.008
81	12,148,100	10,871,868	11,060,468	101.73%	0.048	0.066
82	12,447,827	12,631,700	12,447,827	98.54%	0.040	0.025
83	14,604,848	14,401,100	14,454,848	100.37%	0.157	0.161
84	15,241,733	15,237,800	15,048,533	98.76%	0.043	0.030
85	21,580,334	21,172,900	21,020,344	99.28%	0.389	0.379
86	22,491,137	22,712,000	21,078,169	92.81%	0.052	-0.023
87	22,976,853	22,655,000	22,353,990	98.67%	0.007	-0.006
88	23,701,252	23,681,200	23,427,732	98.93%	0.031	0.020

Maximum:	1.017	0.389	0.379
Minimum:	0.928	-0.009	-0.023
Average:	0.988	0.072	0.059
Avg absolute:	0.988	0.073	0.067
Range:	0.089	0.398	0.402
Std dev:	0.022	0.114	0.118

Regression Output

Constant	-0.0140
Std Err of Y Est	0.0245
R Squared	0.9612
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.0144	0.0679

MILITARY PERSONNEL, NAVY
(NOMINAL $ 000)

FY	CSE (BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	6,157,000	6,055,667	6,002,268			
78	6,529,100	6,182,312	6,169,662	99.80%	0.004	0.002
79	6,768,300	6,463,000	6,461,600	99.98%	-0.010	-0.010
80	7,271,093	6,914,500	6,857,256	99.17%	0.022	0.013
81	8,612,706	7,533,294	7,857,423	104.30%	0.036	0.081
82	9,117,956	9,340,090	9,117,956	97.62%	0.084	0.059
83	10,661,208	10,578,900	10,537,408	99.61%	0.160	0.156
84	11,450,908	11,309,800	11,171,278	98.78%	0.061	0.048
85	16,060,907	15,897,500	15,660,246	98.51%	0.388	0.368
86	16,989,409	17,221,400	15,917,144	92.43%	0.072	-0.009
87	17,550,397	17,459,500	17,104,850	97.97%	0.028	0.007
88	18,176,297	18,259,100	17,971,297	98.42%	0.040	0.024

Maximum:	1.043	0.388	0.368
Minimum:	0.924	-0.010	-0.010
Average:	0.988	0.081	0.067
Avg absolute:	0.988	0.082	0.071
Range:	0.119	0.398	0.378
Std dev:	0.028	0.112	0.111

Regression Output

Constant	-0.0100
Std Err of Y Est	0.0305
R Squared	0.9318
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9565	0.0862

MILITARY PERSONNEL, MARINE CORPS
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	1,909,500	1,883,900	1,854,334			
78	2,020,364	1,923,000	1,918,400	99.76%	0.007	0.005
79	2,112,400	2,016,500	2,014,975	99.92%	-0.002	-0.003
80	2,218,281	2,135,000	2,089,457	97.87%	0.011	-0.011
81	2,558,500	2,260,051	2,350,086	103.98%	0.019	0.059
82	2,766,966	2,807,870	2,766,966	98.54%	0.097	0.081
83	3,330,977	3,276,100	3,293,277	100.52%	0.184	0.190
84	3,519,569	3,467,300	3,433,859	99.04%	0.041	0.031
85	4,934,346	4,845,900	4,803,366	99.12%	0.377	0.365
86	5,196,279	5,217,400	4,870,016	93.34%	0.057	-0.013
87	5,407,053	5,333,400	5,266,053	98.74%	0.026	0.013
88	5,542,842	5,549,000	5,478,266	98.73%	0.026	0.013

Maximum:	1.040	0.377	0.365
Minimum:	0.933	-0.002	-0.013
Average:	0.991	0.077	0.066
Avg absolute:	0.991	0.077	0.071
Range:	0.106	0.379	0.378
Std dev:	0.025	0.113	0.115

Regression Output

Constant	-0.0096
Std Err of Y Est	0.0275
R Squared	0.9487
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9925	0.0770

MILITARY PERSONNEL, AIR FORCE
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	7,363,600	7,169,567	7,136,706			
78	7,596,700	7,240,200	7,199,900	99.44%	-0.017	-0.022
79	7,891,200	7,576,000	7,525,001	99.33%	-0.003	-0.009
80	8,391,115	7,966,900	7,863,817	98.71%	0.010	-0.003
81	9,866,871	8,728,209	8,976,309	102.84%	0.040	0.070
82	10,305,414	10,440,820	10,305,414	98.70%	0.058	0.044
83	12,195,950	12,031,400	12,099,850	100.57%	0.167	0.174
84	12,905,263	12,779,000	12,577,203	98.42%	0.048	0.031
85	18,020,153	17,799,900	17,572,005	98.72%	0.379	0.362
86	19,006,575	19,187,900	17,744,770	92.48%	0.065	-0.015
87	19,457,758	19,290,500	18,940,731	98.19%	0.015	-0.003
88	19,815,960	19,908,200	19,583,118	98.37%	0.023	0.006

Maximum:	1.028	0.379	0.362
Minimum:	0.925	-0.017	-0.022
Average:	0.987	0.071	0.058
Avg absolute:	0.987	0.075	0.067
Range:	0.104	0.396	0.384
Std dev:	0.025	0.113	0.115

Regression Output

Constant	-0.0133
Std Err of Y Est	0.0276
R Squared	0.9486
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9924	0.0770

OPERATION & MAINTENANCE, ARMY
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	8,112,333	8,060,400	7,898,285			
78	8,509,674	8,490,869	8,139,413	95.86%	0.047	0.003
79	9,294,167	9,233,400	9,115,000	98.72%	0.085	0.071
80	10,539,618	10,265,500	9,915,368	96.59%	0.105	0.067
81	12,478,184	12,505,808	12,307,784	98.42%	0.187	0.168
82	14,948,197	15,207,500	15,037,897	98.88%	0.219	0.205
83	15.982,939	16,816,100	15,847,425	94.24%	0.125	0.060
84	17,244,396	17,655,800	17,054,846	96.60%	0.105	0.067
85	18,603,698	19,486,518	18,411,078	94.48%	0.130	0.068
86	20,210,669	20,190,630	18,975,507	93.98%	0.085	0.020
87	20,440,016	21,341,870	20,022,399	93.82%	0.056	-0.009
88	21,130,958	22,120,394	20,853,205	94.27%	0.082	0.020

Maximum:	0.989	0.219	0.205
Minimum:	0.938	0.047	-0.009
Average:	0.962	0.114	0.072
Avg absolute:	0.874	0.104	0.067
Range:	0.051	0.172	0.214
Std dev:	0.020	0.054	0.068

Regression Output

Constant	-0.0680
Std Err of Y Est	0.0191
R Squared	0.9246
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.2153	0.1157

OPERATION & MAINTENANCE, NAVY
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	9,697,116	9,660,800	9,565,164			
78	11,036,563	10,891,862	10,743,263	98.64%	0.123	0.108
79	11,824,095	11,843,000	11,691,000	98.72%	0.073	0.059
80	13,591,595	13,561,846	13,272,245	97.86%	0.147	0.122
81	17,246,094	16,896,652	16,870,894	99.85%	0.243	0.241
82	19,359,489	19,611,170	19,385,889	98.85%	0.137	0.124
83	21,093,657	22,142,000	21,079,712	95.20%	0.144	0.089
84	22,176,128	22,601,600	21,943,818	97.09%	0.071	0.040
85	25,334,741	26,248,426	25,116,241	95.69%	0.184	0.133
86	25,072,519	25,797,700	24,477,071	94.88%	0.018	-0.034
87	23,303,965	25,688,500	22,939,674	89.30%	0.025	-0.085
88	24,708,375	25,652,830	23,601,462	92.00%	0.101	0.013

Maximum:	0.998	0.243	0.241
Minimum:	0.893	0.018	-0.085
Average:	0.962	0.115	0.074
Avg absolute:	0.962	0.115	0.095
Range:	0.105	0.225	0.326
Std dev:	0.032	0.067	0.089

Regression Output

Constant	-0.0713
Std Err of Y Est	0.0305
R Squared	0.8947
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.2596	0.1440

OPERATION & MAINTENANCE, MARINE CORPS
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	600,409	580,400	569,288	98.09%		
78	635,028	636,200	615,628	96.77%	0.060	0.025
79	735,800	744,100	733,000	98.51%	0.172	0.154
80	818,646	764,500	802,046	104.91%	0.039	0.090
81	1,030,600	1,035,642	1,003,900	96.94%	0.265	0.226
82	1,178,740	1,176,940	1,185,540	100.73%	0.142	0.150
83	1,469,647	1,481,800	1,481,671	99.99%	0.257	0.257
84	1,548,620	1,554,900	1,524,600	98.05%	0.058	0.037
85	1,650,894	1,683,069	1,640,294	97.46%	0.087	0.059
86	1,666,450	1,667,400	1,612,050	96.68%	0.010	-0.024
87	1,809,640	1,864,100	1,793,750	96.23%	0.119	0.076
88	1,795,288	1,918,367	1,819,188	94.83%	0.060	0.005

Maximum:	1.049	0.265	0.257
Minimum:	0.948	0.010	-0.024
Average:	0.983	0.115	0.096
Avg absolute:	0.983	0.115	0.100
Range:	0.101	0.255	0.281
Std dev:	0.028	0.086	0.091

Regression Output

Constant	-0.0188
Std Err of Y Est	0.0312
R Squared	0.8933
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9974	0.1149

OPERATION & MAINTENANCE, AIR FORCE
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	8,249,835	8,224,700	8,107,077			
78	8,719,879	8,586,114	8,335,279	97.08%	0.041	0.010
79	9,347,684	9,415,200	9,243,000	98.17%	0.080	0.060
80	10,670,250	10,753,600	10,459,750	97.27%	0.150	0.119
81	13,789,546	13,167,626	13,611,046	103.37%	0.234	0.276
82	16,020,619	16,696,076	16,079,719	96.31%	0.211	0.166
83	17,029,403	17,944,700	16,915,766	94.27%	0.120	0.056
84	17,686,095	18,250,100	17,573,895	96.29%	0.072	0.032
85	19,213,465	20,234,500	19,093,265	94.36%	0.144	0.080
86	20,176,538	20,924,400	19,536,813	93.37%	0.089	0.017
87	18,935,773	21,214,500	18,636,816	87.85%	0.051	-0.076
88	19,906,591	21,325,282	19,661,448	92.20%	0.126	0.038

Maximum:	1.034	0.234	0.276
Minimum:	0.878	0.041	-0.076
Average:	0.955	0.120	0.071
Avg absolute:	0.955	0.120	0.085
Range:	0.155	0.193	0.352
Std dev:	0.039	0.062	0.092

Regression Output

Constant	-0.0915
Std Err of Y Est	0.0390
R Squared	0.8377
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.3530	0.1985

AIRCRAFT PROCUREMENT, ARMY
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	546,100	555,500	541,900			
78	659,700	665,300	657,100	98.77%	0.218	0.203
79	949,709	1,017,800	949,709	93.31%	0.543	0.440
80	951,037	946,400	961,837	101.63%	-0.003	0.013
81	1,076,400	933,400	1,076,400	115.32%	-0.019	0.132
82	1,936,100	1,897,300	1,911,100	100.73%	0.763	0.775
83	2,487,072	2,745,914	2,506,572	91.28%	0.418	0.295
84	3,273,248	3,441,100	3,214,048	93.40%	0.384	0.292
85	3,764,267	4,008,300	3,940,900	98.32%	0.225	0.204
86	3,540,571	3,840,646	3,524,200	91.76%	0.020	-0.064
87	2,819,186	3,267,017	2,762,750	84.56%	-0.077	-0.220
88	2,599,096	2,572,523	2,718,406	105.67%	-0.087	-0.036

Maximum:	1.153	0.763	0.775
Minimum:	0.846	-0.087	-0.220
Average:	0.977	0.217	0.185
Avg absolute:	0.977	0.251	0.243
Range:	0.308	0.850	0.995
Std dev:	0.083	0.282	0.273

Regression Output

Constant	-0.0145
Std Err of Y Est	0.0894
R Squared	0.9035
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9203	0.1003

MISSILE PROCUREMENT, ARMY
(NOMINAL $ 000)

FY	CSE (BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	487,000	552,400	497,400			
78	536,883	451,600	536,883	118.88%	-0.073	0.102
79	736,900	773,200	736,900	95.31%	0.440	0.373
80	1,162,500	1,250,500	1,140,800	91.23%	0.697	0.548
81	1,519,800	1,514,400	1,519,800	100.36%	0.303	0.307
82	2,155,200	2,210,200	2,131,200	96.43%	0.454	0.402
83	2,266,600	2,846,600	2,287,000	80.34%	0.321	0.061
84	2,824,100	3,060,500	2,827,300	92.38%	0.350	0.247
85	3,165,915	3,442,400	3,167,000	92.00%	0.219	0.121
86	3,004,845	3,336,291	2,765,932	82.90%	0.054	-0.126
87	2,045,937	2,510,450	2,206,800	87.90%	-0.165	-0.266
88	2,278,025	2,470,996	2,332,237	94.38%	0.208	0.140

Maximum:	1.189	0.697	0.548
Minimum:	0.803	-0.165	-0.266
Average:	0.938	0.255	0.174
Avg absolute:	0.938	0.298	0.245
Range:	0.385	0.862	0.814
Std dev:	0.101	0.247	0.237

Regression Output

Constant	-0.0453
Std Err of Y Est	0.1102
R Squared	0.8049
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.8578	0.1408

PROCUREMENT OF WEAPONS AND TRACKED COMBAT VEHICLES, ARMY
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	1,129,600	1,147,900	1,117,600			
78	1,421,200	1,651,700	1,421,200	86.04%	0.462	0.258
79	1,511,100	1,636,600	1,511,100	92.33%	0.152	0.063
80	1,824,500	1,888,900	1,836,200	97.21%	0.250	0.215
81	2,582,200	2,519,000	2,582,200	102.51%	0.381	0.415
82	3,876,300	3,856,700	3,825,200	99.18%	0.494	0.481
83	4,698,546	5,024,485	4,750,146	94.54%	0.296	0.225
84	4,663,033	4,890,416	4,743,103	96.99%	0.041	0.009
85	5,001,165	5,092,700	4,548,100	89.31%	0.092	-0.025
86	4,498,153	5,658,926	4,684,800	82.79%	0.132	-0.063
87	3,588,138	4,289,240	3,804,300	88.69%	-0.046	-0.154
88	3,198,399	3,311,786	3,207,187	96.84%	-0.077	-0.106

Maximum:	1.025	0.494	0.481
Minimum:	0.828	-0.077	-0.154
Average:	0.933	0.198	0.120
Avg absolute:	0.933	0.220	0.183
Range:	0.197	0.571	0.636
Std dev:	0.060	0.195	0.213

Regression Output

Constant	-0.0822
Std Err of Y Est	0.0784
R Squared	0.8780
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.0224	0.1271

PROCUREMENT OF AMMUNITION, ARMY
(NOMINAL $ 000)

FY	CSE (BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	909,700	910,800	902,900			
78	1,265,000	1,348,900	1,236,800	91.69%	0.483	0.360
79	1,248,100	1,420,100	1,248,100	87.89%	0.123	-0.013
80	1,232,800	1,343,400	1,232,800	91.77%	0.076	-0.012
81	1,531,000	1,515,100	1,531,000	101.05%	0.229	0.242
82	2,302,500	2,282,500	2,381,900	104.35%	0.491	0.556
83	2,121,994	2,625,684	2,122,394	80.83%	0.140	-0.078
84	1,939,900	2,311,189	1,980,100	85.67%	0.089	-0.067
85	2,621,848	2,494,000	2,646,300	106.11%	0.286	0.364
86	2,421,486	2,607,516	2,497,200	95.77%	-0.005	-0.048
87	2,112,307	2,161,241	2,087,150	96.57%	-0.107	-0.138
88	2,337,035	2,191,275	2,273,592	103.76%	0.037	0.076

Maximum:	1.061	0.491	0.556
Minimum:	0.808	-0.107	-0.138
Average:	0.950	0.167	0.113
Avg absolute:	0.950	0.188	0.178
Range:	0.253	0.598	0.694
Std dev:	0.083	0.190	0.230

Regression Output

Constant	-0.0708
Std Err of Y Est	0.1013
R Squared	0.8249
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.0971	0.1685

OTHER PROCUREMENT, ARMY
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	1,393,600	1,417,900	1,366,600			
78	1,418,025	1,503,400	1,406,025	93.52%	0.079	0.009
79	1,682,250	1,789,200	1,682,250	94.02%	0.262	0.186
80	1,454,810	1,694,200	1,482,410	87.50%	0.007	-0.119
81	2,223,658	2,321,833	2,223,658	95.77%	0.596	0.528
82	3,705,871	3,683,800	3,721,971	101.04%	0.657	0.674
83	4,108,304	4,625,791	4,123,404	89.14%	0.248	0.113
84	4,649,928	5,267,877	4,680,528	88.85%	0.282	0.139
85	5,035,470	6,022,400	5,122,450	85.06%	0.295	0.102
86	5,003,389	5,485,606	5,270,556	96.08%	0.089	0.047
87	4,812,747	5,707,693	5,118,752	89.68%	0.141	0.023
88	4,847,669	5,650,374	5,093,549	90.15%	0.174	0.058

Maximum:	1.010	0.657	0.674
Minimum:	0.851	0.007	-0.119
Average:	0.919	0.257	0.160
Avg absolute:	0.919	0.257	0.182
Range:	0.160	0.650	0.793
Std dev:	0.046	0.205	0.234

Regression Output

Constant	-0.1270
Std Err of Y Est	0.0548
R Squared	0.9508
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.1155	0.0845

AIRCRAFT PROCUREMENT, NAVY
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	2,910,400	3,032,500	2,843,500			
78	3,479,000	3,599,600	3,479,000	96.65%	0.237	0.195
79	4,358,700	4,078,800	4,358,700	106.86%	0.172	0.253
80	4,428,746	3,967,900	4,441,446	111.93%	-0.090	0.019
81	6,110,707	5,015,300	6,110,707	121.84%	0.132	0.380
82	9,140,000	9,244,500	9,115,800	98.61%	0.513	0.492
83	10,268,327	11,582,300	10,416,107	89.93%	0.267	0.140
84	10,164,608	11,028,300	10,174,608	92.26%	0.074	-0.009
85	11,046,531	11,474,200	10,903,798	95.03%	0.129	0.073
86	10,605,603	11,792,830	11,175,678	94.77%	0.068	0.012
87	9,883,013	11,436,059	9,794,262	85.64%	0.078	-0.077
88	8,660,524	9,943,763	9,522,299	95.76%	0.006	-0.036

Maximum:	1.218	0.513	0.492
Minimum:	0.856	-0.090	-0.077
Average:	0.990	0.144	0.131
Avg absolute:	0.990	0.161	0.153
Range:	0.362	0.602	0.568
Std dev:	0.105	0.158	0.182

Regression Output

Constant	0.0019
Std Err of Y Est	0.1212
R Squared	0.6020
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.8948	0.2425

WEAPONS PROCUREMENT, NAVY
(NOMINAL $ 000)

FY	CSE (BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	2,045,200	2,239,700	2,022,200			
78	2,234,600	2,359,400	2,234,600	94.71%	0.154	0.093
79	1,955,600	2,047,500	1,955,600	95.51%	-0.084	-0.125
80	1,962,214	1,973,500	1,996,514	101.17%	0.009	0.021
81	2,738,132	2,253,500	2,766,029	122.74%	0.148	0.410
82	3,215,100	3,283,800	3,207,100	97.66%	0.199	0.171
83	3,435,100	3,901,600	3,561,700	91.29%	0.214	0.108
84	3,769,579	3,992,600	3,758,564	94.14%	0.162	0.094
85	4,430,247	4,650,860	4,336,611	93.24%	0.234	0.150
86	4,894,757	5,155,255	5,017,295	97.32%	0.164	0.133
87	5,085,089	5,762,743	5,186,847	90.01%	0.177	0.060
88	5,483,198	6,014,969	5,967,019	99.20%	0.183	0.173

Maximum:	1.227	0.234	0.410
Minimum:	0.900	-0.084	-0.125
Average:	0.979	0.142	0.117
Avg absolute:	0.979	0.157	0.140
Range:	0.327	0.318	0.535
Std dev:	0.089	0.095	0.129

Regression Output

Constant	-0.0014
Std Err of Y Est	0.1070
R Squared	0.3768
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.8348	0.3579

SHIPBUILDING & CONVERSION, NAVY
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	6,195,000	7,263,500	6,195,000			
78	5,802,500	5,931,200	5,802,500	97.83%	-0.043	-0.063
79	3,759,600	4,712,400	3,759,600	79.78%	-0.188	-0.352
80	6,682,350	6,173,800	6,648,050	107.68%	0.642	0.768
81	7,483,600	6,179,200	7,483,600	121.11%	-0.075	0.120
82	8,638,900	8,475,300	8,938,900	105.47%	0.133	0.194
83	16,248,100	18,648,300	16,287,900	87.34%	1.159	0.885
84	11,437,000	12,585,800	11,302,500	89.80%	-0.225	-0.304
85	11,281,770	13,141,900	11,736,000	89.30%	0.149	0.026
86	9,495,668	11,209,588	10,598,700	94.55%	-0.006	-0.061
87	9,885,786	11,975,007	10,086,989	84.23%	0.261	0.062
88	14,861,742	10,769,975	16,155,355	150.00%	0.089	0.634

Maximum:	1.500	1.159	0.885
Minimum:	0.798	-0.225	-0.352
Average:	1.006	0.172	0.174
Avg absolute:	1.006	0.270	0.316
Range:	0.702	1.384	1.237
Std dev:	0.203	0.405	0.415

Regression Output

Constant	0.0241
Std Err of Y Est	0.2338
R Squared	0.7150
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.8679	0.1827

OTHER PROCUREMENT, NAVY
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	2,199,200	2,192,800	2,173,400			
78	2,186,410	2,220,600	2,186,410	98.46%	0.010	-0.006
79	2,641,600	2,708,600	2,641,600	97.53%	0.239	0.208
80	2,624,756	2,694,500	2,624,756	97.41%	0.020	-0.006
81	3,037,657	3,201,891	3,037,657	94.87%	0.220	0.157
82	3,676,577	3,822,000	3,708,777	97.04%	0.258	0.221
83	3,653,275	3,969,356	3,727,075	93.90%	0.080	0.014
84	4,314,543	4,887,501	4,177,680	85.48%	0.338	0.144
85	5,663,184	5,953,900	5,290,614	88.86%	0.380	0.226
86	5,961,232	6,220,377	6,121,630	98.41%	0.098	0.081
87	6,461,087	6,664,038	5,912,071	88.72%	0.118	-0.008
88	5,090,533	5,227,057	4,872,461	93.22%	-0.191	-0.246

Maximum:	0.985	0.380	0.226
Minimum:	0.855	-0.191	-0.246
Average:	0.940	0.143	0.071
Avg absolute:	0.940	0.177	0.120
Range:	0.130	0.571	0.472
Std dev:	0.045	0.165	0.141

Regression Output

Constant	-0.0428
Std Err of Y Est	0.0529
R Squared	0.8742
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.7996	0.1011

PROCUREMENT, MARINE CORPS
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	319,800	337,700	328,400			
78	450,200	460,000	450,200	97.87%	0.438	0.408
79	356,000	371,900	356,000	95.72%	-0.174	-0.209
80	283,785	284,200	283,785	99.85%	-0.202	-0.203
81	486,813	618,621	486,813	78.69%	1.180	0.715
82	1,711,456	1,734,916	1,711,456	98.65%	2.564	2.516
83	1,977,383	2,300,700	2,008,083	87.28%	0.344	0.173
84	1,741,306	1,835,049	1,741,306	94.89%	-0.072	-0.119
85	1,879,999	1,978,581	1,836,722	92.83%	0.136	0.055
86	1,674,965	1,743,844	1,660,766	95.24%	-0.072	-0.117
87	1,563,556	1,604,819	1,465,215	91.30%	-0.042	-0.125
88	1,304,114	1,423,225	1,295,599	91.03%	-0.090	-0.171

Maximum:	0.999	2.564	2.516
Minimum:	0.787	-0.202	-0.209
Average:	0.930	0.365	0.266
Avg absolute:	0.930	0.483	0.437
Range:	0.212	2.766	2.725
Std dev:	0.060	0.832	0.801

Regression Output

Constant	-0.0814
Std Err of Y Est	0.1291
R Squared	0.9766
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9517	0.0491

AIRCRAFT PROCUREMENT, AIR FORCE
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	6,148,100	6,344,800	6,089,200			
78	6,241,500	6,144,000	6,296,400	102.48%	-0.001	0.024
79	6,885,207	6,897,700	6,893,307	99.94%	0.105	0.104
80	8,082,181	7,931,200	8,085,040	101.94%	0.152	0.174
81	9,674,143	8,654,143	9,674,143	111.79%	0.071	0.197
82	13,802,798	13,843,898	13,818,998	99.82%	0.431	0.428
83	17,595,300	17,834,800	17,828,500	99.96%	0.292	0.292
84	21,387,710	22,506,190	21,390,310	95.04%	0.279	0.216
85	24,823,163	28,676,500	26,188,266	91.32%	0.341	0.224
86	21,671,523	25,591,445	23,255,424	90.87%	0.031	-0.063
87	18,085,305	20,025,852	17,131,281	85.55%	-0.076	-0.210
88	14,497,623	15,591,487	12,956,827	83.10%	-0.138	-0.284

Maximum:	1.118	0.431	0.428
Minimum:	0.831	-0.138	-0.284
Average:	0.965	0.135	0.100
Avg absolute:	0.965	0.174	0.201
Range:	0.287	0.569	0.712
Std dev:	0.083	0.181	0.215

Regression Output

Constant	-0.0484
Std Err of Y Est	0.0856
R Squared	0.8579
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.0998	0.1492

MISSILE PROCUREMENT, AIR FORCE
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	1,864,000	1,916,400	1,861,000			
78	1,740,300	1,903,700	1,745,200	91.67%	0.021	-0.064
79	1,513,500	1,676,800	1,579,800	94.22%	-0.036	-0.092
80	2,182,985	2,303,600	2,175,385	94.43%	0.522	0.437
81	3,140,917	3,077,584	3,140,917	102.06%	0.410	0.439
82	4,573,950	4,204,646	4,559,550	108.44%	0.339	0.452
83	4,958,700	6,795,900	4,956,100	72.93%	0.486	0.084
84	7,811,838	8,059,130	7,802,838	96.82%	0.625	0.574
85	7,651,268	9,820,600	8,409,245	85.63%	0.257	0.076
86	7,416,495	10,085,288	8,312,442	82.42%	0.318	0.086
87	7,940,083	8,436,889	7,446,718	88.26%	0.138	0.004
88	7,675,491	9,355,658	7,290,771	77.93%	0.178	-0.082

Maximum:	1.084	0.625	0.574
Minimum:	0.729	-0.036	-0.092
Average:	0.904	0.296	0.174
Avg absolute:	0.904	0.303	0.217
Range:	0.355	0.662	0.666
Std dev:	0.104	0.209	0.250

Regression Output

Constant	-0.1163
Std Err of Y Est	0.1502
R Squared	0.6741
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9802	0.2272

OTHER PROCUREMENT, AIR FORCE
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	2,296,600	2,424,900	2,309,700			
78	2,328,245	2,477,000	2,342,145	94.56%	0.079	0.020
79	2,393,650	2,516,100	2,399,250	95.36%	0.081	0.030
80	2,632,741	2,674,100	2,647,631	99.01%	0.117	0.106
81	2,999,372	3,257,876	2,999,372	92.07%	0.237	0.139
82	5,366,433	5,174,144	5,366,433	103.72%	0.725	0.789
83	5,540,940	5,836,200	5,568,740	95.42%	0.088	0.038
84	6,895,937	7,465,212	6,914,232	92.62%	0.347	0.248
85	8,366,940	9,561,500	8,861,697	92.68%	0.387	0.285
86	7,568,638	9,200,629	8,272,383	89.91%	0.100	-0.011
87	9,035,977	10,045,714	9,254,941	92.13%	0.327	0.223
88	8,294,529	8,687,445	8,010,827	92.21%	-0.039	-0.113

Maximum:	1.037	0.725	0.789
Minimum:	0.899	-0.039	-0.113
Average:	0.945	0.223	0.159
Avg absolute:	0.945	0.230	0.182
Range:	0.138	0.764	0.903
Std dev:	0.039	0.214	0.241

Regression Output

Constant	-0.0862
Std Err of Y Est	0.0500
R Squared	0.9613
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.1033	0.0738

RESEARCH, DEVELOPMENT, TEST, & EVALUATION, ARMY
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	2,305,117	2,386,197	2,280,816			
78	2,418,327	2,522,100	2,417,882	95.87%	0.094	0.049
79	2,635,864	2,721,400	2,635,864	96.86%	0.125	0.090
80	2,845,231	2,927,000	2,855,331	97.55%	0.110	0.083
81	3,086,757	3,234,483	3,086,757	95.43%	0.137	0.085
82	3,609,535	3,768,500	3,609,535	95.78%	0.221	0.169
83	3,884,783	4,503,500	3,879,683	86.15%	0.248	0.075
84	4,259,375	4,711,200	4,199,125	89.13%	0.213	0.081
85	4,398,047	4,987,100	4,349,015	87.21%	0.171	0.021
86	4,611,638	5,189,521	4,798,172	92.46%	0.180	0.091
87	4,707,161	5,465,494	4,556,076	83.36%	0.185	-0.012
88	4,688,304	5,450,548	4,687,513	86.00%	0.158	-0.004

Maximum:	0.976	0.248	0.169
Minimum:	0.834	0.094	-0.012
Average:	0.914	0.167	0.066
Avg absolute:	0.914	0.167	0.069
Range:	0.142	0.154	0.181
Std dev:	0.052	0.048	0.051

Regression Output

Constant	0.0299
Std Err of Y Est	0.0528
R Squared	0.0416
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.2165	0.3462

RESEARCH, DEVELOPMENT, TEST, & EVALUATION, NAVY
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	3,800,395	4,055,200	3,722,792			
78	4,021,791	4,212,900	3,991,791	94.75%	0.109	0.050
79	4,483,871	4,490,500	4,483,871	99.85%	0.117	0.115
80	4,566,019	4,484,000	4,553,319	101.55%	0.000	0.015
81	4,895,109	4,862,879	4,867,212	100.09%	0.065	0.066
82	5,807,121	5,885,488	5,844,357	99.30%	0.202	0.194
83	6,086,031	6,211,400	5,965,751	96.05%	0.070	0.027
84	7,571,718	8,059,743	7,559,818	93.80%	0.324	0.242
85	9,199,183	9,826,076	9,172,622	93.35%	0.298	0.211
86	10,004,437	11,156,830	10,065,239	90.22%	0.213	0.094
87	9,342,430	10,558,998	9,326,418	88.33%	0.055	-0.068
88	9,448,106	10,448,112	9,493,546	90.86%	0.118	0.016

Maximum:	1.015	0.324	0.242
Minimum:	0.883	0.000	-0.068
Average:	0.953	0.143	0.088
Avg absolute:	0.953	0.143	0.100
Range:	0.132	0.324	0.310
Std dev:	0.045	0.104	0.096

Regression Output

Constant	-0.0272
Std Err of Y Est	0.0492
R Squared	0.7608
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.8044	0.1504

RESEARCH, DEVELOPMENT, TEST, & EVALUATION, AIR FORCE
(NOMINAL $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	3,806,440	3,924,600	3,749,530			
78	3,952,666	4,532,400	3,917,766	86.44%	0.191	0.029
79	4,211,040	4,339,100	4,131,040	95.20%	0.098	0.045
80	5,026,032	5,060,100	5,023,173	99.27%	0.202	0.193
81	6,775,811	7,033,393	6,774,011	96.31%	0.399	0.348
82	8,819,310	8,823,400	8,569,610	97.12%	0.302	0.265
83	10,625,561	11,273,500	10,650,661	94.48%	0.278	0.208
84	12,220,706	12,781,197	12,227,706	95.67%	0.203	0.151
85	13,832,461	14,401,955	13,424,147	93.21%	0.178	0.098
86	13,235,595	15,454,165	13,718,208	88.77%	0.117	-0.008
87	15,241,679	16,785,723	15,062,783	89.74%	0.268	0.138
88	15,195,966	18,279,422	15,002,095	82.07%	0.199	-0.016

Maximum:	0.993	0.399	0.348
Minimum:	0.821	0.098	-0.016
Average:	0.926	0.221	0.132
Avg absolute:	0.926	0.221	0.136
Range:	0.172	0.302	0.364
Std dev:	0.052	0.086	0.116

Regression Output

Constant	-0.1244
Std Err of Y Est	0.0632
R Squared	0.7333
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.1572	0.2326

APPENDIX D

BUDGETARY DATA SET (CONSTANT FY 1989 DOLLARS)

MILITARY PERSONNEL, ARMY
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	18,299,979	17,912,453	17,668,684			
78	17,660,487	16,977,487	16,882,580	99.44%	-0.072	-0.077
79	17,451,255	16,696,981	16,650,282	99.72%	-0.055	-0.057
80	17,550,776	16,659,168	16,354,565	98.17%	-0.045	-0.063
81	17,856,975	15,980,991	16,258,221	101.73%	-0.089	-0.074
82	16,036,881	16,273,770	16,036,881	98.54%	-0.089	-0.102
83	18,181,063	17,927,424	17,994,333	100.37%	0.118	0.122
84	18,116,882	18,112,207	17,887,238	98.76%	-0.004	-0.016
85	23,970,159	23,517,605	23,348,155	99.28%	0.298	0.289
86	24,264,901	24,503,183	22,740,500	92.81%	0.022	-0.051
87	24,451,264	24,108,758	23,788,432	98.67%	-0.006	-0.020
88	24,446,882	24,426,199	24,164,757	98.93%	-0.001	-0.012
			Maximum:	1.017	0.298	0.289
			Minimum:	0.928	-0.089	-0.102
			Average:	0.988	0.007	-0.006
			Avg absolute:	0.988	0.073	0.080
			Range:	0.089	0.388	0.391
			Std dev:	0.022	0.114	0.114

Regression Output

Constant	-0.0124
Std Err of Y Est	0.0235
R Squared	0.9619
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9864	0.0655

MILITARY PERSONNEL, NAVY
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	12,702,703	12,493,639	12,383,470			
78	12,609,309	11,939,575	11,915,145	99.80%	-0.060	-0.062
79	12,310,477	11,755,184	11,752,637	99.98%	-0.068	-0.068
80	12,298,872	11,695,704	11,598,877	99.17%	-0.050	-0.058
81	12,660,159	11,073,488	11,549,938	104.30%	-0.100	-0.061
82	11,746,916	12,033,097	11,746,916	97.62%	-0.050	-0.072
83	13,271,764	13,169,302	13,117,650	99.61%	0.121	0.117
84	13,610,969	13,443,243	13,278,590	98.78%	0.013	0.001
85	17,839,506	17,658,003	17,394,475	98.51%	0.297	0.278
86	18,329,279	18,579,566	17,172,450	92.43%	0.041	-0.037
87	18,676,596	18,579,866	18,202,458	97.97%	0.014	-0.007
88	18,748,114	18,833,522	18,536,665	98.42%	0.008	-0.007
		Maximum:		1.043	0.297	0.278
		Minimum:		0.924	-0.100	-0.072
		Average:		0.988	0.015	0.002
		Avg absolute:		0.988	0.075	0.070
		Range:		0.119	0.397	0.350
		Std dev:		0.028	0.112	0.106

Regression Output

Constant	-0.0120
Std Err of Y Est	0.0275
R Squared	0.9400
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9194	0.0774

MILITARY PERSONNEL, MARINE CORPS
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	3,939,550	3,886,734	3,825,736			
78	3,901,823	3,713,789	3,704,905	99.76%	-0.057	-0.060
79	3,842,124	3,667,697	3,664,924	99.92%	-0.060	-0.061
80	3,752,167	3,611,299	3,534,264	97.87%	-0.060	-0.080
81	3,760,841	3,322,139	3,454,485	103.98%	-0.115	-0.079
82	3,564,759	3,617,457	3,564,759	98.54%	-0.038	-0.052
83	4,146,616	4,078,302	4,099,685	100.52%	0.144	0.150
84	4,183,489	4,121,360	4,081,611	99.04%	-0.006	-0.016
85	5,480,780	5,382,539	5,335,295	99.12%	0.287	0.275
86	5,606,084	5,628,870	5,254,090	93.34%	0.027	-0.041
87	5,754,020	5,675,641	5,603,973	98.74%	0.012	0.000
88	5,717,217	5,723,569	5,650,610	98.73%	-0.005	-0.018

Maximum:	1.040	0.287	0.275
Minimum:	0.933	-0.115	-0.080
Average:	0.991	0.012	0.002
Avg absolute:	0.991	0.074	0.076
Range:	0.106	0.401	0.355
Std dev:	0.025	0.113	0.111

Regression Output

Constant	-0.0096
Std Err of Y Est	0.0254
R Squared	0.9530
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9600	0.0711

MILITARY PERSONNEL, AIR FORCE
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	15,192,078	14,791,762	14,723,965			
78	14,671,109	13,982,619	13,904,789	99.44%	-0.080	-0.085
79	14,352,856	13,779,556	13,686,797	99.33%	-0.061	-0.067
80	14,193,361	13,475,812	13,301,450	98.71%	-0.061	-0.073
81	14,503,706	12,829,941	13,194,633	102.84%	-0.096	-0.070
82	13,276,751	13,451,198	13,276,751	98.70%	-0.073	-0.085
83	15,182,310	14,977,468	15,062,679	100.57%	0.128	0.135
84	15,339,668	15,189,588	14,949,724	98.42%	0.000	-0.015
85	20,015,720	19,771,076	19,517,944	98.72%	0.289	0.272
86	20,505,529	20,701,154	19,144,212	92.48%	0.034	-0.044
87	20,706,351	20,528,360	20,156,147	98.19%	0.001	-0.017
88	20,439,360	20,534,502	20,199,193	98.37%	-0.008	-0.024

Maximum:	1.028	0.289	0.272
Minimum:	0.925	-0.096	-0.085
Average:	0.987	0.007	-0.007
Avg absolute:	0.987	0.076	0.081
Range:	0.104	0.385	0.357
Std dev:	0.025	0.114	0.111

Regression Output

Constant	-0.0132
Std Err of Y Est	0.0258
R Squared	0.9516
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9568	0.0719

OPERATION & MAINTENANCE, ARMY
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	15,332,325	15,234,171	14,927,774			
78	14,913,554	14,880,598	14,264,657	95.86%	-0.029	-0.070
79	15,012,384	14,914,230	14,722,985	98.72%	0.000	-0.013
80	14,681,178	14,299,345	13,811,628	96.59%	-0.047	-0.080
81	15,827,225	15,862,263	15,611,091	98.42%	0.080	0.063
82	18,044,661	18,357,677	18,152,942	98.88%	0.160	0.147
83	18,921,438	19,907,778	18,761,010	94.24%	0.103	0.040
84	20,121,816	20,601,867	19,900,637	96.60%	0.089	0.052
85	21,215,302	22,222,053	20,995,641	94.48%	0.104	0.043
86	22,979,726	22,956,941	21,575,335	93.98%	0.082	0.017
87	22,548,280	23,543,155	22,087,589	93.82%	0.025	-0.039
88	21,895,097	22,920,313	21,607,300	94.27%	0.016	-0.042

Maximum:	0.989	0.160	0.147
Minimum:	0.938	-0.047	-0.080
Average:	0.960	0.053	0.011
Avg absolute:	0.960	0.067	0.055
Range:	0.051	0.207	0.227
Std dev:	0.020	0.064	0.067

Regression Output

Constant	-0.0419
Std Err of Y Est	0.0224
R Squared	0.9007
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9948	0.1101

OPERATION & MAINTENANCE, NAVY
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	18,327,568	18,258,930	18,078,178			
78	19,342,031	19,088,437	18,828,011	98.64%	0.042	0.027
79	19,098,845	19,129,381	18,883,864	98.72%	-0.011	-0.024
80	18,932,435	18,890,996	18,487,596	97.86%	-0.011	-0.032
81	21,874,802	21,431,573	21,398,902	99.85%	0.132	0.130
82	23,369,736	23,673,551	23,401,604	98.85%	0.082	0.070
83	24,971,773	26,212,857	24,955,265	95.20%	0.122	0.068
84	25,876,462	26,372,929	25,605,389	97.09%	0.056	0.025
85	28,891,254	29,933,203	28,642,081	95.69%	0.157	0.107
86	28,507,696	29,332,234	27,830,666	94.88%	0.015	-0.037
87	25,707,628	28,338,114	25,305,763	89.30%	-0.006	-0.112
88	25,601,881	26,580,489	24,454,939	92.00%	0.034	-0.049

Maximum:	0.998	0.157	0.130
Minimum:	0.893	-0.011	-0.112
Average:	0.962	0.056	0.016
Avg absolute:	0.962	0.061	0.062
Range:	0.105	0.168	0.243
Std dev:	0.032	0.060	0.074

Regression Output

Constant	-0.0456
Std Err of Y Est	0.0339
R Squared	0.8101
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.1054	0.1784

OPERATION & MAINTENANCE, MARINE CORPS
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	1,134,774	1,096,957	1,075,955			
78	1,112,913	1,114,967	1,078,913	96.77%	-0.017	-0.049
79	1,188,499	1,201,906	1,183,977	98.51%	0.080	0.064
80	1,140,334	1,064,912	1,117,211	104.91%	-0.104	-0.060
81	1,307,204	1,313,600	1,273,338	96.94%	0.152	0.117
82	1,422,912	1,420,739	1,431,120	100.73%	0.087	0.095
83	1,739,845	1,754,232	1,754,080	99.99%	0.233	0.233
84	1,807,025	1,814,352	1,778,996	98.05%	0.043	0.023
85	1,882,648	1,919,340	1,870,560	97.46%	0.062	0.035
86	1,894,770	1,895,850	1,832,916	96.68%	0.007	-0.026
87	1,996,293	2,056,371	1,978,764	96.23%	0.085	0.044
88	1,860,209	1,987,739	1,884,974	94.83%	-0.004	-0.056
		Maximum:		1.049	0.233	0.233
		Minimum:		0.948	-0.104	-0.060
		Average:		0.983	0.057	0.038
		Avg absolute:		0.983	0.080	0.073
		Range:		0.101	0.337	0.293
		Std dev:		0.028	0.089	0.089

Regression Output

Constant	-0.0154
Std Err of Y Est	0.0280
R Squared	0.9101
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9441	0.0989

OPERATION & MAINTENANCE, AIR FORCE
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	15,592,204	15,544,699	15,322,391			
78	15,281,947	15,047,518	14,607,920	97.08%	-0.035	-0.063
79	15,098,827	15,207,882	14,929,737	98.17%	-0.005	-0.023
80	14,863,142	14,979,245	14,569,926	97.27%	-0.008	-0.035
81	17,490,545	16,701,707	17,264,137	103.37%	0.124	0.162
82	19,339,231	20,154,606	19,410,573	96.31%	0.152	0.110
83	20,160,297	21,243,874	20,025,768	94.27%	0.098	0.035
84	20,637,217	21,295,333	20,506,295	96.29%	0.056	0.017
85	21,910,668	23,075,037	21,773,594	94.36%	0.118	0.055
86	22,940,919	23,791,245	22,213,545	93.37%	0.086	0.014
87	20,888,884	23,402,648	20,559,091	87.85%	0.020	-0.104
88	20,626,454	22,096,448	20,372,446	92.20%	0.058	-0.025

Maximum:	1.034	0.152	0.162
Minimum:	0.878	-0.035	-0.104
Average:	0.955	0.060	0.013
Avg absolute:	0.955	0.069	0.058
Range:	0.155	0.187	0.265
Std dev:	0.039	0.061	0.076

Regression Output

Constant	-0.0502
Std Err of Y Est	0.0436
R Squared	0.7062
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.0463	0.2250

AIRCRAFT PROCUREMENT, ARMY
(CONSTANT FY 89 $ 000)

FY	CSE (BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	1,081,815	1,100,436	1,073,494			
78	1,188,435	1,198,523	1,183,751	98.77%	0.108	0.094
79	1,547,766	1,658,735	1,547,766	93.31%	0.396	0.302
80	1,403,745	1,396,900	1,419,686	101.63%	-0.097	-0.083
81	1,461,706	1,267,518	1,461,706	115.32%	-0.097	0.041
82	2,469,200	2,419,717	2,437,317	100.73%	0.655	0.667
83	3,029,689	3,345,004	3,053,444	91.28%	0.355	0.237
84	3,858,142	4,055,988	3,788,364	93.40%	0.339	0.250
85	4,304,479	4,583,533	4,506,461	98.32%	0.188	0.168
86	3,920,898	4,253,207	3,902,769	91.76%	-0.012	-0.093
87	3,015,172	3,494,136	2,954,813	84.56%	-0.109	-0.246
88	2,683,907	2,656,467	2,807,111	105.67%	-0.119	-0.069

Maximum:	1.153	0.655	0.667
Minimum:	0.846	-0.119	-0.246
Average:	0.977	0.146	0.115
Avg absolute:	0.977	0.225	0.205
Range:	0.308	0.774	0.914
Std dev:	0.083	0.262	0.251

Regression Output

Constant	-0.0175
Std Err of Y Est	0.0835
R Squared	0.9004
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9098	0.1009

MISSILE PROCUREMENT, ARMY
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	964,739	1,094,295	985,341			
78	967,182	813,547	967,182	118.88%	-0.157	0.003
79	1,200,945	1,260,104	1,200,945	95.31%	0.303	0.242
80	1,715,867	1,845,756	1,683,838	91.23%	0.537	0.402
81	2,063,824	2,056,491	2,063,824	100.36%	0.199	0.203
82	2,748,629	2,818,773	2,718,021	96.43%	0.366	0.317
83	2,761,116	3,467,657	2,785,967	80.34%	0.262	0.014
84	3,328,736	3,607,379	3,332,508	92.38%	0.306	0.207
85	3,620,257	3,936,421	3,621,498	92.00%	0.183	0.088
86	3,327,625	3,694,674	3,063,048	82.90%	0.021	-0.154
87	2,188,168	2,684,973	2,360,214	87.90%	-0.193	-0.291
88	2,352,360	2,551,627	2,408,341	94.38%	0.166	0.101

Maximum:	1.189	0.537	0.402
Minimum:	0.803	-0.193	-0.291
Average:	0.938	0.181	0.103
Avg absolute:	0.938	0.245	0.184
Range:	0.385	0.730	0.693
Std dev:	0.101	0.219	0.204

Regression Output

Constant	-0.0460
Std Err of Y Est	0.1009
R Squared	0.7788
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.8217	0.1460

PROCUREMENT OF WEAPONS AND TRACKED COMBAT VEHICLES, ARMY
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	2,237,718	2,273,970	2,213,946			
78	2,560,259	2,975,500	2,560,259	86.04%	0.330	0.144
79	2,462,679	2,667,210	2,462,679	92.33%	0.042	-0.038
80	2,692,989	2,788,044	2,710,258	97.21%	0.132	0.101
81	3,506,518	3,420,695	3,506,518	102.51%	0.270	0.302
82	4,943,630	4,918,633	4,878,459	99.18%	0.403	0.391
83	5,723,652	6,120,703	5,786,510	94.54%	0.238	0.170
84	5,496,267	5,764,281	5,590,645	96.99%	0.007	-0.023
85	5,718,885	5,823,556	5,200,800	89.31%	0.060	-0.054
86	4,981,343	6,266,806	5,188,040	82.79%	0.096	-0.093
87	3,837,581	4,587,422	4,068,770	88.69%	-0.079	-0.183
88	3,302,766	3,419,853	3,311,841	96.84%	-0.109	-0.137

Maximum:	1.025	0.403	0.391
Minimum:	0.828	-0.109	-0.183
Average:	0.933	0.126	0.053
Avg absolute:	0.933	0.160	0.149
Range:	0.197	0.512	0.574
Std dev:	0.060	0.166	0.184

Regression Output

Constant	-0.0770
Std Err of Y Est	0.0737
R Squared	0.8562
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.0276	0.1404

PROCUREMENT OF AMMUNITION, ARMY
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	1,802,100	1,804,279	1,788,629			
78	2,278,869	2,430,013	2,228,067	91.69%	0.348	0.236
79	2,034,061	2,314,374	2,034,061	87.89%	0.016	-0.107
80	1,819,631	1,982,878	1,819,631	91.77%	-0.025	-0.105
81	2,079,033	2,057,442	2,079,033	101.05%	0.131	0.143
82	2,936,488	2,910,981	3,037,750	104.35%	0.400	0.461
83	2,584,960	3,198,543	2,585,448	80.83%	0.089	-0.120
84	2,286,539	2,724,174	2,333,923	85.67%	0.054	-0.097
85	2,998,111	2,851,915	3,026,072	106.11%	0.247	0.323
86	2,681,601	2,887,615	2,765,449	95.77%	-0.037	-0.078
87	2,259,152	2,311,488	2,232,246	96.57%	-0.138	-0.168
88	2,413,295	2,262,779	2,347,782	103.76%	0.002	0.039

Maximum:	1.061	0.400	0.461
Minimum:	0.808	-0.138	-0.168
Average:	0.950	0.099	0.048
Avg absolute:	0.950	0.135	0.171
Range:	0.253	0.538	0.629
Std dev:	0.083	0.169	0.212

Regression Output

Constant	-0.0647
Std Err of Y Est	0.0944
R Squared	0.8220
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.1403	0.1769

OTHER PROCUREMENT, ARMY
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	2,760,697	2,808,835	2,707,211			
78	2,554,540	2,708,341	2,532,922	93.52%	-0.019	-0.083
79	2,741,607	2,915,906	2,741,607	94.02%	0.141	0.073
80	2,147,321	2,500,664	2,188,059	87.50%	-0.088	-0.202
81	3,019,633	3,152,951	3,019,633	95.77%	0.468	0.406
82	4,726,273	4,698,125	4,746,807	101.04%	0.556	0.572
83	5,004,634	5,635,024	5,023,028	89.14%	0.192	0.063
84	5,480,820	6,209,190	5,516,888	88.85%	0.241	0.102
85	5,758,113	6,886,678	5,857,576	85.06%	0.257	0.069
86	5,540,852	6,074,868	5,836,718	96.08%	0.055	0.014
87	5,147,323	6,104,484	5,474,601	89.68%	0.102	-0.012
88	5,005,854	5,834,752	5,259,757	90.15%	0.134	0.022

Maximum:	1.010	0.556	0.572
Minimum:	0.851	-0.088	-0.202
Average:	0.919	0.185	0.093
Avg absolute:	0.919	0.205	0.147
Range:	0.160	0.644	0.774
Std dev:	0.046	0.192	0.217

Regression Output

Constant	-0.1093
Std Err of Y Est	0.0552
R Squared	0.9416
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.0925	0.0907

AIRCRAFT PROCUREMENT, NAVY
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	5,765,452	6,007,330	5,632,924			
78	6,267,339	6,484,597	6,267,339	96.65%	0.125	0.087
79	7,103,488	6,647,327	7,103,488	106.86%	0.061	0.133
80	6,536,894	5,856,679	6,555,640	111.93%	-0.176	-0.077
81	8,298,081	6,810,565	8,298,081	121.84%	0.042	0.269
82	11,656,676	11,789,900	11,625,813	98.61%	0.421	0.401
83	12,508,621	14,109,270	12,688,643	89.93%	0.210	0.089
84	11,980,915	12,998,939	11,992,702	92.26%	0.039	-0.041
85	12,631,825	13,120,869	12,468,608	95.03%	0.095	0.041
86	11,744,854	13,059,612	12,376,166	94.77%	0.034	-0.020
87	10,570,067	12,231,079	10,475,147	85.64%	0.041	-0.108
88	8,943,127	10,268,239	9,833,023	95.76%	-0.029	-0.070

Maximum:	1.218	0.421	0.401
Minimum:	0.856	-0.176	-0.108
Average:	0.990	0.079	0.064
Avg absolute:	0.990	0.116	0.122
Range:	0.362	0.596	0.509
Std dev:	0.105	0.148	0.157

Regression Output

Constant	0.0014
Std Err of Y Est	0.1098
R Squared	0.5625
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.7969	0.2343

WEAPONS PROCUREMENT, NAVY
(CONSTANT FY 89 $ 000)

FY	CSE (BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	4,051,506	4,436,807	4,005,943			
78	4,025,581	4,250,405	4,025,581	94.71%	0.049	-0.006
79	3,187,093	3,336,864	3,187,093	95.51%	-0.171	-0.208
80	2,896,257	2,912,915	2,946,884	101.17%	-0.086	-0.075
81	3,718,267	3,060,158	3,756,150	122.74%	0.057	0.297
82	4,100,370	4,187,986	4,090,167	97.66%	0.126	0.100
83	4,184,554	4,752,832	4,338,775	91.29%	0.159	0.058
84	4,443,162	4,706,035	4,430,179	94.14%	0.125	0.059
85	5,066,034	5,318,308	4,958,961	93.24%	0.197	0.116
86	5,420,550	5,709,031	5,556,251	97.32%	0.127	0.097
87	5,438,598	6,163,361	5,547,430	90.01%	0.137	0.023
88	5,662,121	6,211,244	6,161,730	99.20%	0.142	0.133

Maximum:	1.227	0.197	0.297
Minimum:	0.900	-0.171	-0.208
Average:	0.979	0.078	0.054
Avg absolute:	0.979	0.125	0.107
Range:	0.327	0.368	0.505
Std dev:	0.089	0.112	0.128

Regression Output

Constant	-0.0077
Std Err of Y Est	0.0976
R Squared	0.4749
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.7859	0.2755

SHIPBUILDING & CONVERSION, NAVY
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	12,272,187	14,388,867	12,272,187			
78	10,453,072	10,684,922	10,453,072	97.83%	-0.129	-0.148
79	6,127,119	7,679,922	6,127,119	79.78%	-0.265	-0.414
80	9,863,247	9,112,620	9,812,620	107.68%	0.487	0.602
81	10,162,412	8,391,092	10,162,412	121.11%	-0.149	0.030
82	11,017,600	10,808,953	11,400,204	105.47%	0.064	0.122
83	19,793,032	22,716,896	19,841,515	87.34%	1.062	0.801
84	13,480,669	14,834,748	13,322,136	89.80%	-0.251	-0.327
85	12,900,823	15,027,902	13,420,240	89.30%	0.115	-0.004
86	10,515,690	12,413,719	11,737,209	94.55%	-0.038	-0.090
87	10,573,033	12,807,494	10,788,224	84.23%	0.218	0.026
88	15,346,698	11,121,412	16,682,523	150.00%	0.052	0.578

Maximum:	1.500	1.062	0.801
Minimum:	0.798	-0.265	-0.414
Average:	1.006	0.106	0.107
Avg absolute:	1.006	0.257	0.286
Range:	0.702	1.327	1.215
Std dev:	0.203	0.385	0.392

Regression Output

Constant	0.0159
Std Err of Y Est	0.2225
R Squared	0.7100
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.8578	0.1827

OTHER PROCUREMENT, NAVY
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	4,356,577	4,343,899	4,305,468			
78	3,938,768	4,000,360	3,938,768	98.46%	-0.082	-0.096
79	4,305,085	4,414,276	4,305,085	97.53%	0.121	0.093
80	3,874,179	3,977,122	3,874,179	97.41%	-0.076	-0.100
81	4,125,010	4,348,032	4,125,010	94.87%	0.122	0.065
82	4,688,913	4,874,378	4,729,980	97.04%	0.182	0.147
83	4,450,329	4,835,371	4,540,230	93.90%	0.031	-0.032
84	5,085,506	5,760,845	4,924,187	85.48%	0.294	0.106
85	6,475,911	6,808,348	6,049,873	88.86%	0.339	0.190
86	6,601,586	6,888,568	6,779,214	98.41%	0.064	0.047
87	6,910,253	7,127,313	6,323,071	88.72%	0.080	-0.042
88	5,256,643	5,397,622	5,031,455	93.22%	-0.219	-0.272

Maximum:	0.985	0.339	0.190
Minimum:	0.855	-0.219	-0.272
Average:	0.940	0.078	0.010
Avg absolute:	0.940	0.146	0.108
Range:	0.130	0.558	0.462
Std dev:	0.045	0.164	0.134

Regression Output

Constant	-0.0502
Std Err of Y Est	0.0471
R Squared	0.8885
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.7681	0.0907

PROCUREMENT, MARINE CORPS
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	633,518	668,978	650,555			
78	811,025	828,680	811,025	97.87%	0.308	0.280
79	580,183	606,095	580,183	95.72%	-0.253	-0.285
80	418,871	419,483	418,871	99.85%	-0.277	-0.278
81	661,071	840,061	661,071	78.69%	1.006	0.578
82	2,182,701	2,212,621	2,182,701	98.65%	2.347	2.302
83	2,408,799	2,802,656	2,446,197	87.28%	0.284	0.121
84	2,052,459	2,162,953	2,052,459	94.89%	-0.102	-0.148
85	2,149,799	2,262,528	2,100,311	92.83%	0.102	0.023
86	1,854,889	1,931,167	1,839,165	95.24%	-0.102	-0.144
87	1,672,252	1,716,384	1,567,075	91.30%	-0.075	-0.155
88	1,346,669	1,469,666	1,337,876	91.03%	-0.121	-0.200

Maximum:	0.999	2.347	2.302
Minimum:	0.787	-0.277	-0.285
Average:	0.930	0.283	0.190
Avg absolute:	0.930	0.452	0.410
Range:	0.212	2.624	2.586
Std dev:	0.060	0.775	0.748

Regression Output

Constant	-0.0800
Std Err of Y Est	0.1193
R Squared	0.9771
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9541	0.0487

AIRCRAFT PROCUREMENT, AIR FORCE
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	12,179,279	12,568,938	12,062,599			
78	11,243,920	11,068,276	11,342,821	102.48%	-0.091	-0.069
79	11,221,002	11,241,362	11,234,203	99.94%	0.000	-0.001
80	11,929,418	11,706,568	11,933,638	101.94%	0.043	0.064
81	13,137,076	11,751,960	13,137,076	111.79%	-0.015	0.101
82	17,603,364	17,655,781	17,624,025	99.82%	0.344	0.342
83	21,434,158	21,725,911	21,718,236	99.96%	0.234	0.234
84	25,209,465	26,527,805	25,212,529	95.04%	0.238	0.176
85	28,385,549	32,791,881	29,946,559	91.32%	0.301	0.188
86	23,999,472	28,340,471	25,753,515	90.87%	-0.002	-0.093
87	19,342,572	21,418,024	18,322,226	85.55%	-0.108	-0.237
88	14,970,697	16,100,255	13,379,623	83.10%	-0.168	-0.308

Maximum:	1.118	0.344	0.342
Minimum:	0.831	-0.168	-0.308
Average:	0.965	0.071	0.036
Avg absolute:	0.965	0.140	0.165
Range:	0.287	0.512	0.650
Std dev:	0.083	0.178	0.200

Regression Output

Constant	-0.0372
Std Err of Y Est	0.0831
R Squared	0.8455
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.0382	0.1479

MISSILE PROCUREMENT, AIR FORCE
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	3,692,552	3,796,355	3,686,609			
78	3,135,111	3,429,472	3,143,938	91.67%	-0.071	-0.149
79	2,466,591	2,732,725	2,574,641	94.22%	-0.128	-0.179
80	3,222,118	3,400,148	3,210,900	94.43%	0.378	0.302
81	4,265,232	4,179,229	4,265,232	102.06%	0.297	0.324
82	5,833,376	5,362,385	5,815,011	108.44%	0.257	0.363
83	6,040,565	8,278,597	6,037,398	72.93%	0.419	0.035
84	9,207,730	9,499,210	9,197,122	96.82%	0.573	0.523
85	8,749,306	11,229,960	9,616,061	85.63%	0.220	0.044
86	8,213,173	11,168,647	9,205,362	82.42%	0.277	0.052
87	8,492,067	9,023,411	7,964,404	88.26%	0.099	-0.030
88	7,925,951	9,660,944	7,528,677	77.93%	0.138	-0.113

Maximum:	1.084	0.573	0.523
Minimum:	0.729	-0.128	-0.179
Average:	0.904	0.223	0.107
Avg absolute:	0.904	0.260	0.192
Range:	0.355	0.701	0.701
Std dev:	0.104	0.207	0.234

Regression Output

Constant	-0.1001
Std Err of Y Est	0.1432
R Squared	0.6643
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.9247	0.2191

OTHER PROCUREMENT, AIR FORCE
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	4,549,525	4,803,685	4,575,475			
78	4,194,280	4,462,259	4,219,321	94.56%	-0.019	-0.073
79	3,900,994	4,100,554	3,910,121	95.36%	-0.022	-0.068
80	3,885,965	3,947,011	3,907,942	99.01%	0.012	0.002
81	4,073,020	4,424,058	4,073,020	92.07%	0.138	0.048
82	6,844,067	6,598,832	6,844,067	103.72%	0.620	0.680
83	6,749,836	7,109,514	6,783,701	95.42%	0.039	-0.009
84	8,128,167	8,799,165	8,149,731	92.62%	0.304	0.207
85	9,567,684	10,933,676	10,133,444	92.68%	0.345	0.247
86	8,381,659	10,188,958	9,161,000	89.91%	0.065	-0.043
87	9,664,147	10,744,079	9,898,333	92.13%	0.282	0.181
88	8,565,189	8,970,926	8,272,229	92.21%	-0.072	-0.144

Maximum:	1.037	0.620	0.680
Minimum:	0.899	-0.072	-0.144
Average:	0.945	0.154	0.094
Avg absolute:	0.945	0.174	0.155
Range:	0.138	0.692	0.824
Std dev:	0.039	0.211	0.232

Regression Output

Constant	-0.0716
Std Err of Y Est	0.0502
R Squared	0.9579
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
1.0745	0.0751

RESEARCH, DEVELOPMENT, TEST, & EVALUATION, ARMY
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	4,374,866	4,528,747	4,328,745			
78	4,241,935	4,423,961	4,241,154	95.87%	0.011	-0.031
79	4,225,495	4,362,616	4,225,495	96.86%	0.028	-0.004
80	4,137,314	4,256,216	4,152,001	97.55%	0.007	-0.017
81	4,132,205	4,329,964	4,132,205	95.43%	0.047	-0.001
82	4,575,402	4,776,905	4,575,402	95.78%	0.156	0.107
83	4,747,963	5,504,155	4,741,729	86.15%	0.203	0.036
84	5,022,256	5,555,005	4,951,214	89.13%	0.170	0.043
85	5,031,515	5,705,411	4,975,420	87.21%	0.136	-0.009
86	5,137,171	5,780,908	5,344,962	92.46%	0.149	0.062
87	5,074,559	5,892,081	4,911,682	83.36%	0.147	-0.044
88	4,859,353	5,649,407	4,858,533	86.00%	0.113	-0.043

Maximum:	0.976	0.203	0.107
Minimum:	0.834	0.007	-0.044
Average:	0.914	0.106	0.009
Avg absolute:	0.914	0.106	0.036
Range:	0.142	0.196	0.151
Std dev:	0.052	0.070	0.048

Regression Output

Constant	-0.0277
Std Err of Y Est	0.0433
R Squared	0.2576
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.3464	0.1960

RESEARCH, DEVELOPMENT, TEST, & EVALUATION, NAVY
(CONSTANT FY 89 $ 000)

FY	CSE(BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	7,212,744	7,696,337	7,065,462			
78	7,054,536	7,389,756	7,001,914	94.75%	0.025	-0.029
79	7,187,995	7,198,621	7,187,995	99.85%	0.020	0.019
80	6,639,551	6,520,285	6,621,083	101.55%	-0.093	-0.079
81	6,553,024	6,509,878	6,515,679	100.09%	-0.020	-0.019
82	7,361,036	7,460,373	7,408,236	99.30%	0.138	0.131
83	7,438,317	7,591,542	7,291,311	96.05%	0.031	-0.009
84	8,927,860	9,503,293	8,913,829	93.80%	0.278	0.198
85	10,524,177	11,241,364	10,493,790	93.35%	0.259	0.175
86	11,144,522	12,428,239	11,212,252	90.22%	0.181	0.065
87	10,071,615	11,383,137	10,054,353	88.33%	0.021	-0.098
88	9,792,813	10,829,303	9,839,911	90.86%	0.075	-0.023
			Maximum:	1.015	0.278	0.198
			Minimum:	0.883	-0.093	-0.098
			Average:	0.953	0.083	0.030
			Avg absolute:	0.953	0.104	0.077
			Range:	0.132	0.371	0.296
			Std dev:	0.045	0.117	0.100

Regression Output

Constant	-0.0344
Std Err of Y Est	0.0438
R Squared	0.9264
No. of Observations	11
Degrees of Freedom	9

X Coefficient(s)	Std Err of Coef.
0.7747	0.1184

RESEARCH, DEVELOPMENT, TEST, & EVALUATION, AIR FORCE
(CONSTANT FY 89 $ 000)

FY	CSE (BASE)	REQUEST	APPRT'N	% REQ APPRT'D	% INC REQ'D	% INC APPRT'D
77	7,224,217	7,448,472	7,116,208			
78	6,933,285	7,950,184	6,872,068	86.44%	0.100	-0.049
79	6,750,625	6,955,915	6,622,379	95.20%	0.003	-0.045
80	7,308,466	7,358,005	7,304,309	99.27%	0.090	0.082
81	9,070,697	9,415,519	9,068,288	96.31%	0.288	0.241
82	11,179,250	11,184,434	10,862,733	97.12%	0.233	0.198
83	12,986,508	13,778,416	13,017,185	94.48%	0.232	0.164
84	14,409,511	15,070,389	14,417,764	95.67%	0.160	0.110
85	15,824,804	16,476,324	15,357,679	93.21%	0.143	0.066
86	14,743,896	17,215,289	15,281,506	88.77%	0.088	-0.034
87	16,431,306	18,095,864	16,238,447	89.74%	0.227	0.101
88	15,750,379	18,946,333	15,549,435	82.07%	0.153	-0.054
			Maximum:	0.993	0.288	0.241
			Minimum:	0.821	0.003	-0.054
			Average:	0.926	0.156	0.071
			Avg absolute:	0.926	0.156	0.104
			Range:	0.172	0.285	0.294
			Std dev:	0.052	0.084	0.105

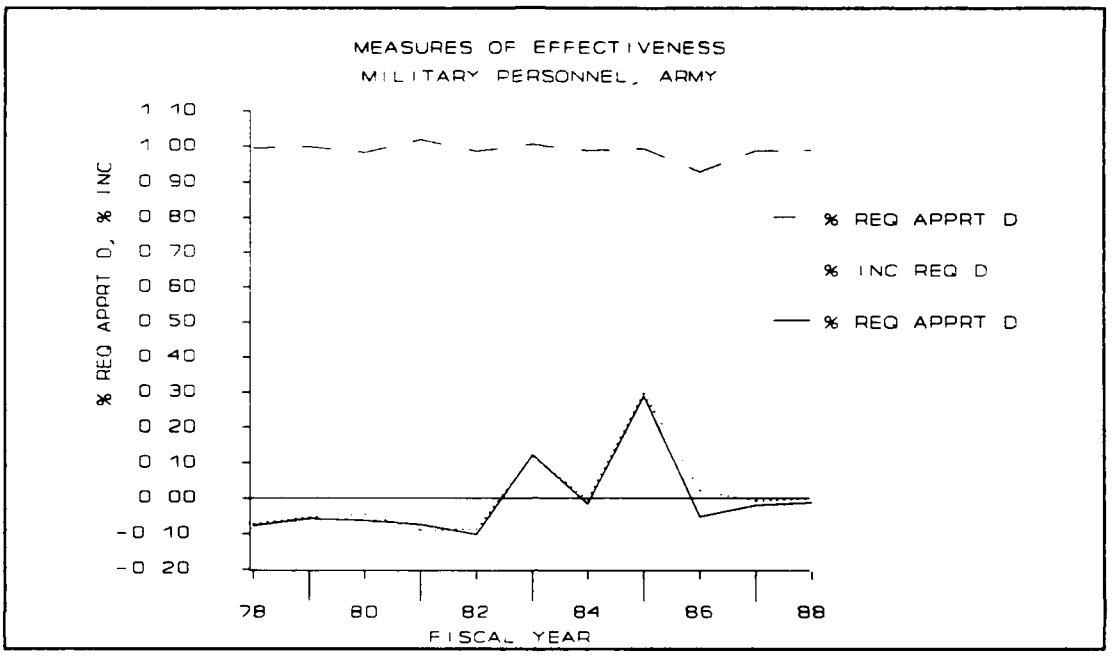
Regression Output

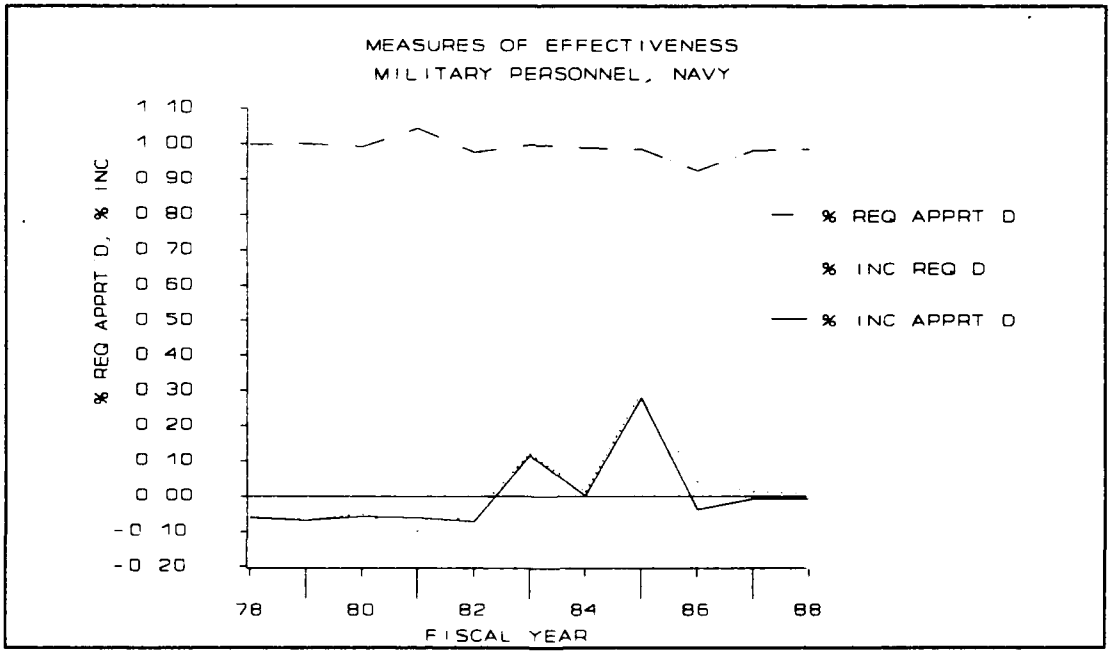
Constant	-0.0920
Std Err of Y Est	0.0620
R Squared	0.6872
No. of Observations	11
Degrees of Freedom	9

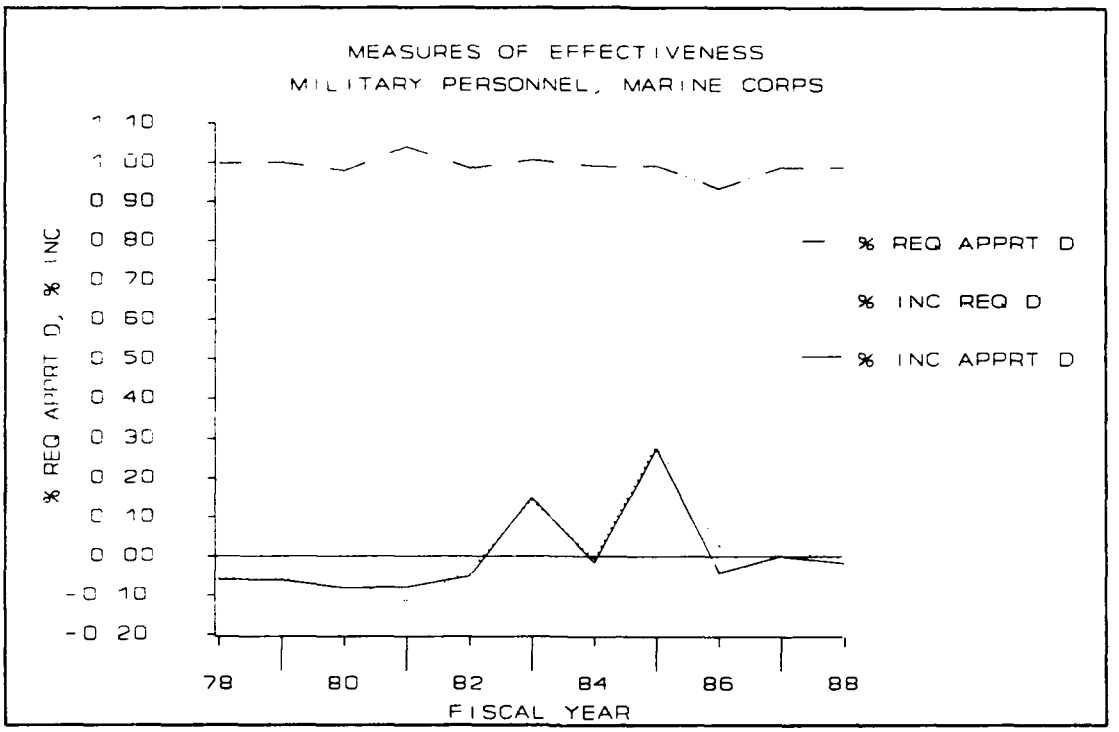
X Coefficient(s)	Std Err of Coef.
1.0421	0.2343

APPENDIX E

GRAPHS: MEASURES OF EFFECTIVENESS






MEASURES OF EFFECTIVENESS
MILITARY PERSONNEL, MARINE CORPS
% REQ APPRT D, % INC
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1 00
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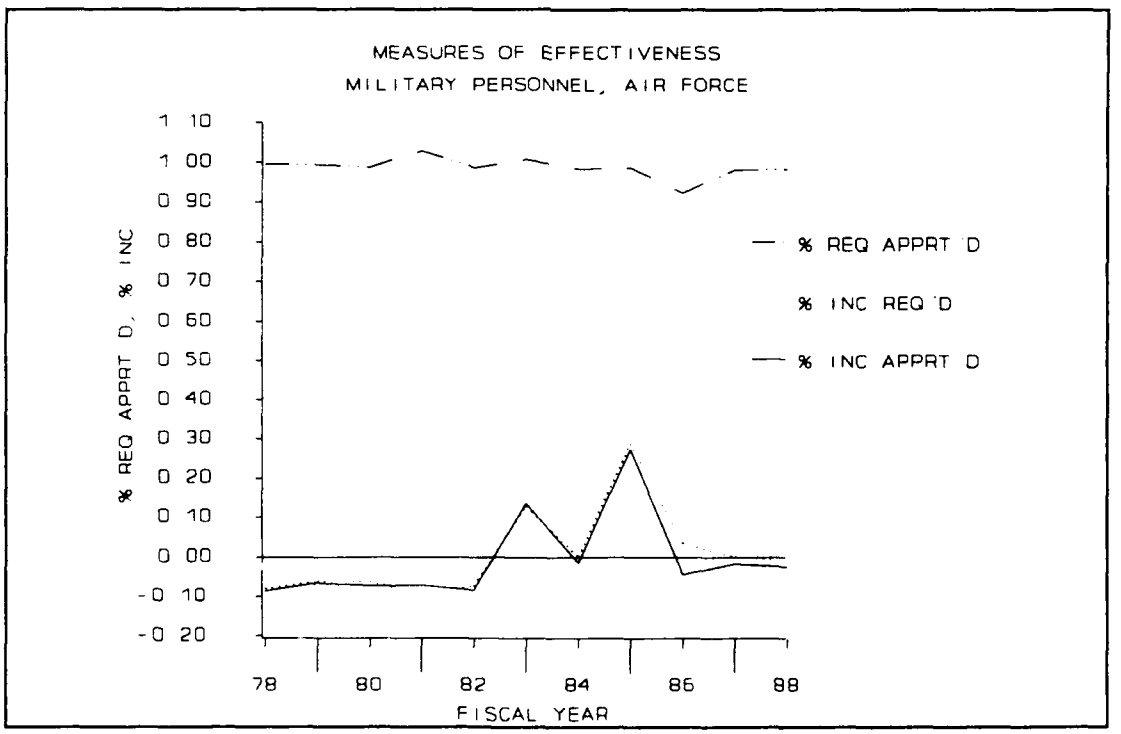
0 80
0 70
0 60
0 50
0 40
0 30
0 20
0 10
0 00
-0 10
-0 20
78
80
82
84
86
88
FISCAL YEAR
% REQ APPRT D
% INC REQ D
% INC APPRT D


MEASURES OF EFFECTIVENESS
MILITARY PERSONNEL, AIR FORCE
% REQ APPRT D, % INC
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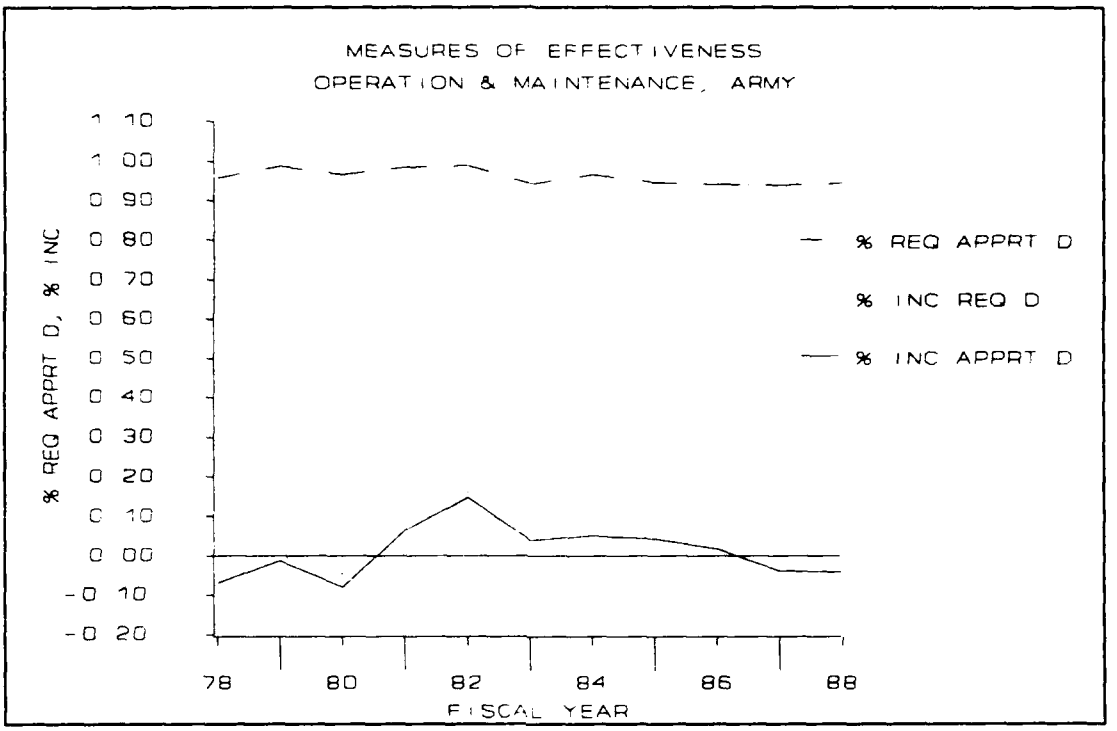
1 00
0 90
0 80
0 70
0 60
0 50
0 40
0 30
0 20
0 10
0 00
-0 10
-0 20
78
80
82
84
86
88
FISCAL YEAR
% REQ APPRT D
% INC REQ D
% INC APPRT D


MEASURES OF EFFECTIVENESS
OPERATION & MAINTENANCE, ARMY
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0 70
0 60
0 50
0 40
0 30
0 20
0 10
0 00
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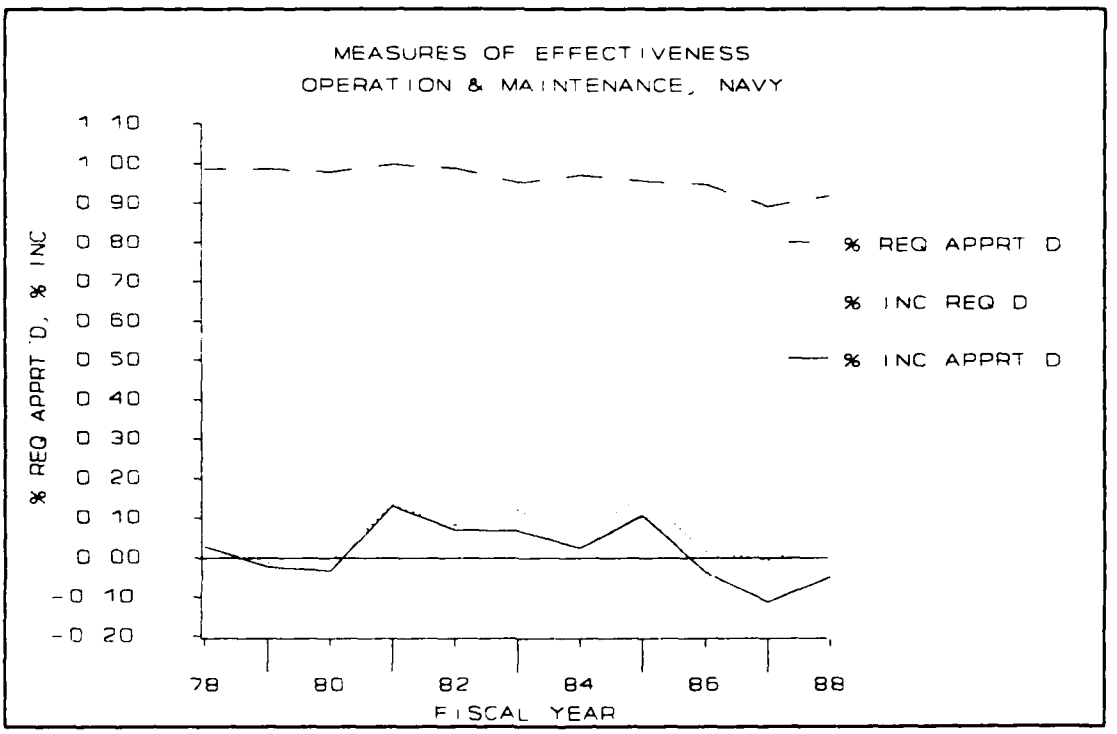
78
80
82
84
86
88
FISCAL YEAR
% REQ APPRT D
% INC REQ D
% INC APPRT D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OPERATION & MAINTENANCE, NAVY
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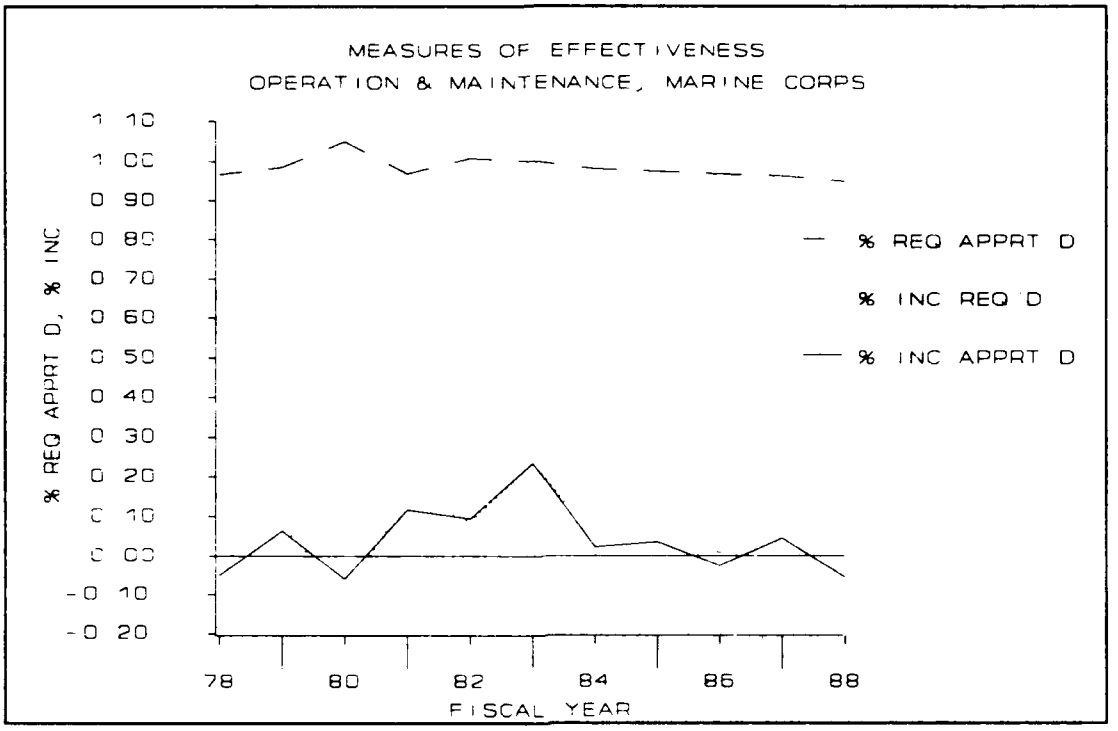
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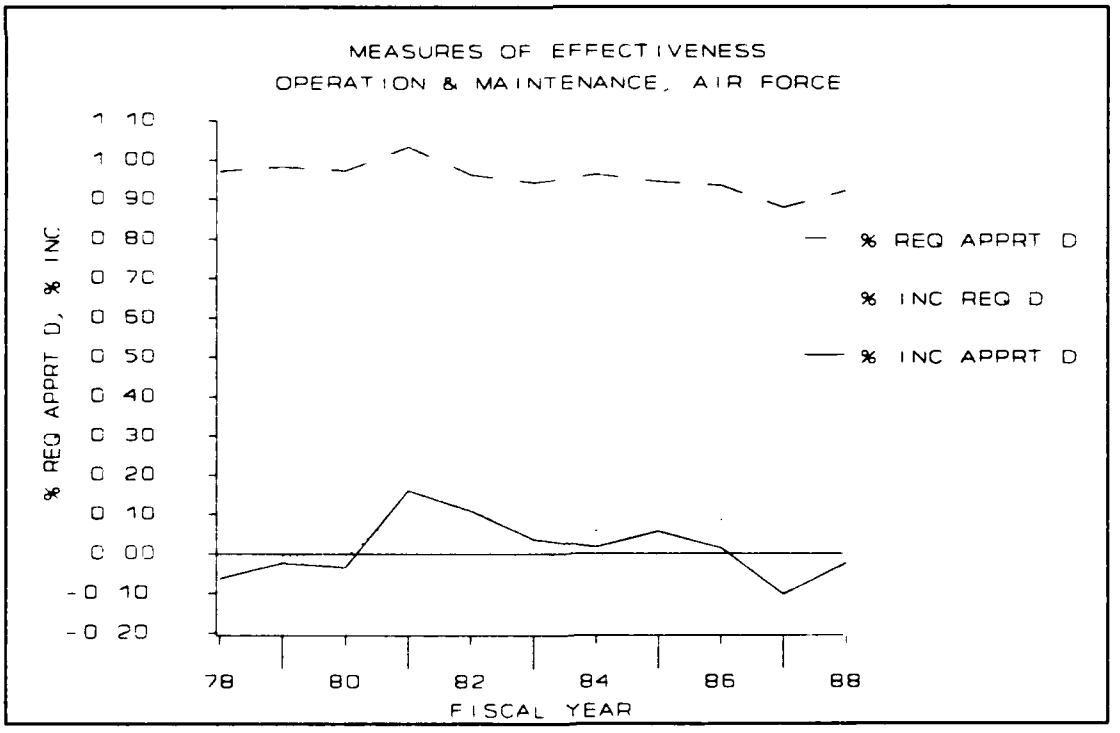
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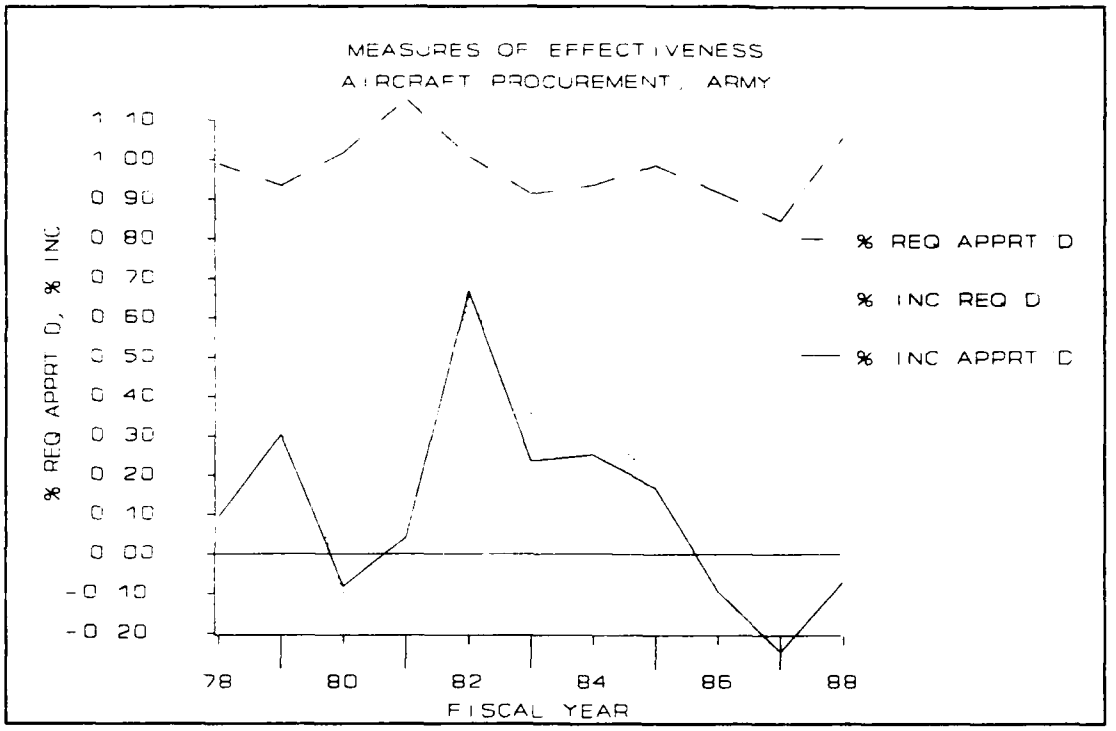
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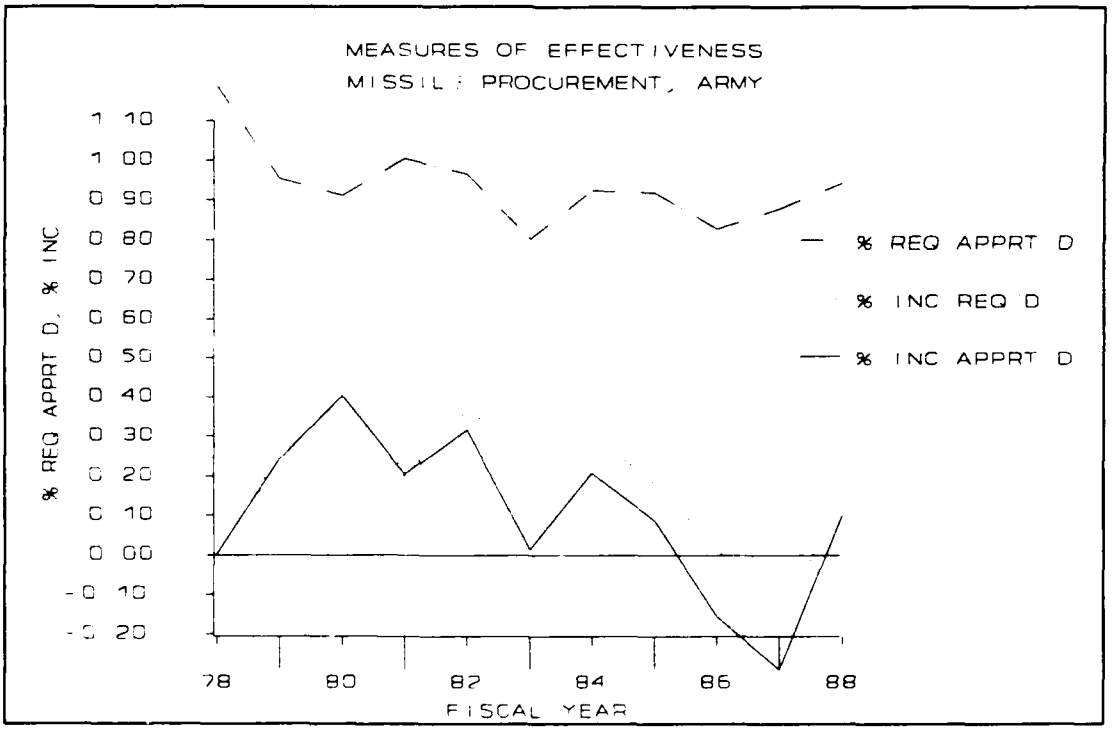
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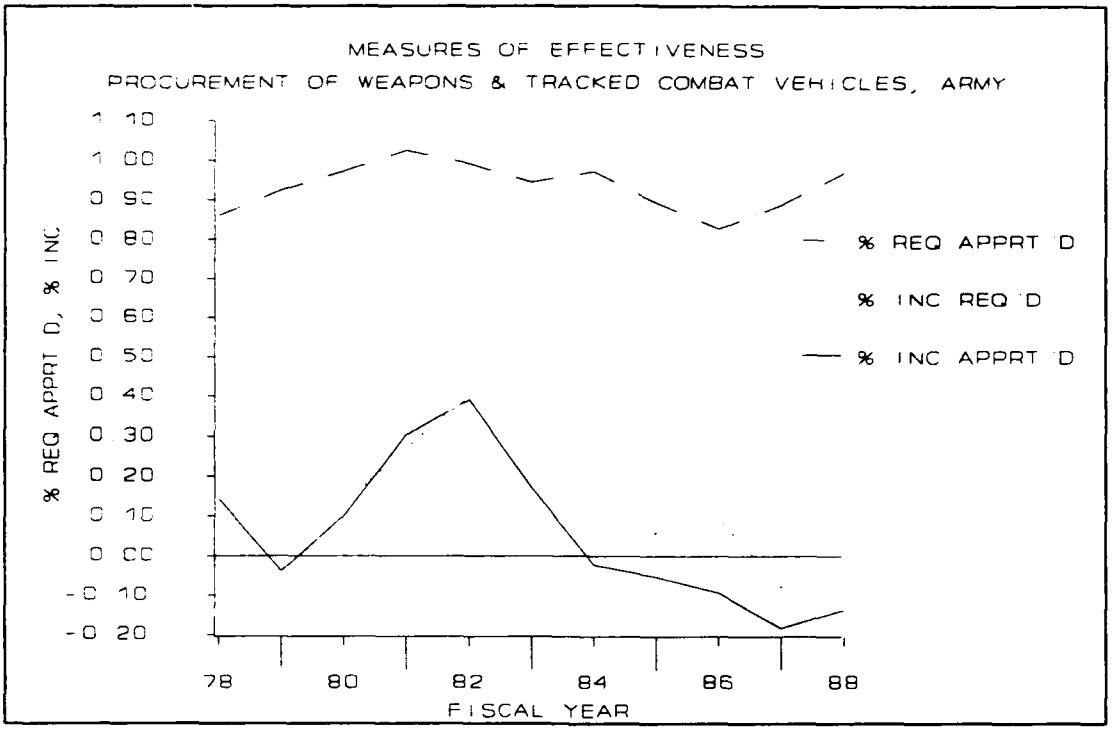
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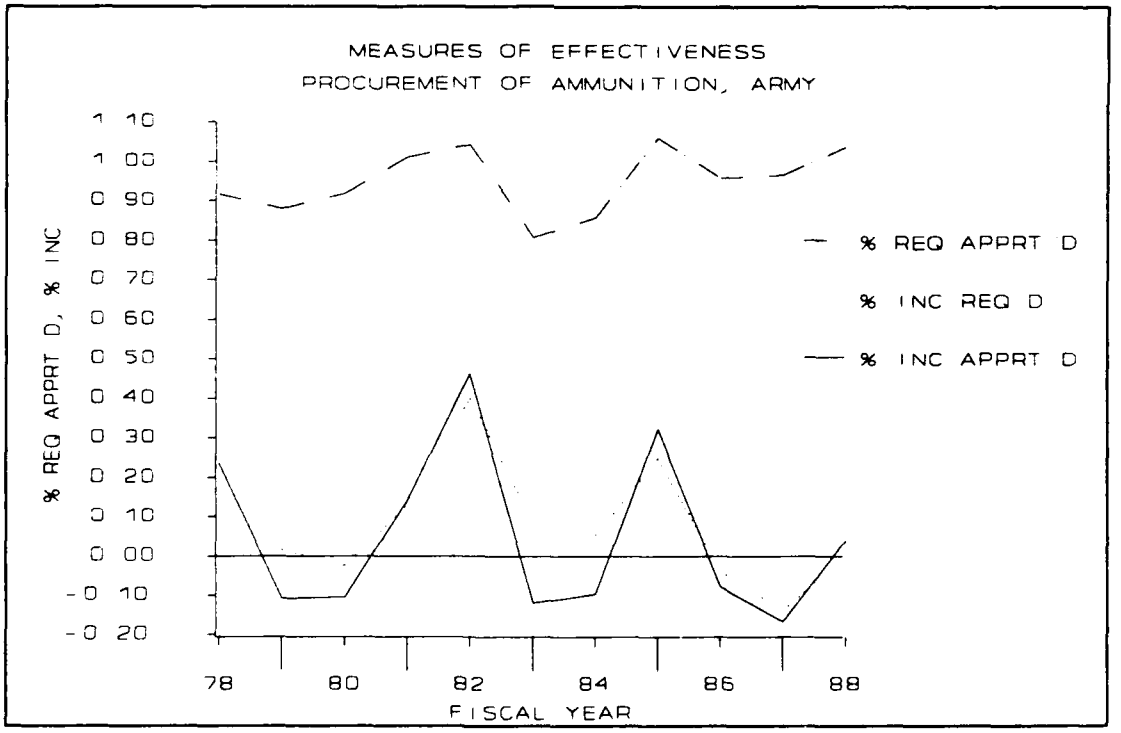
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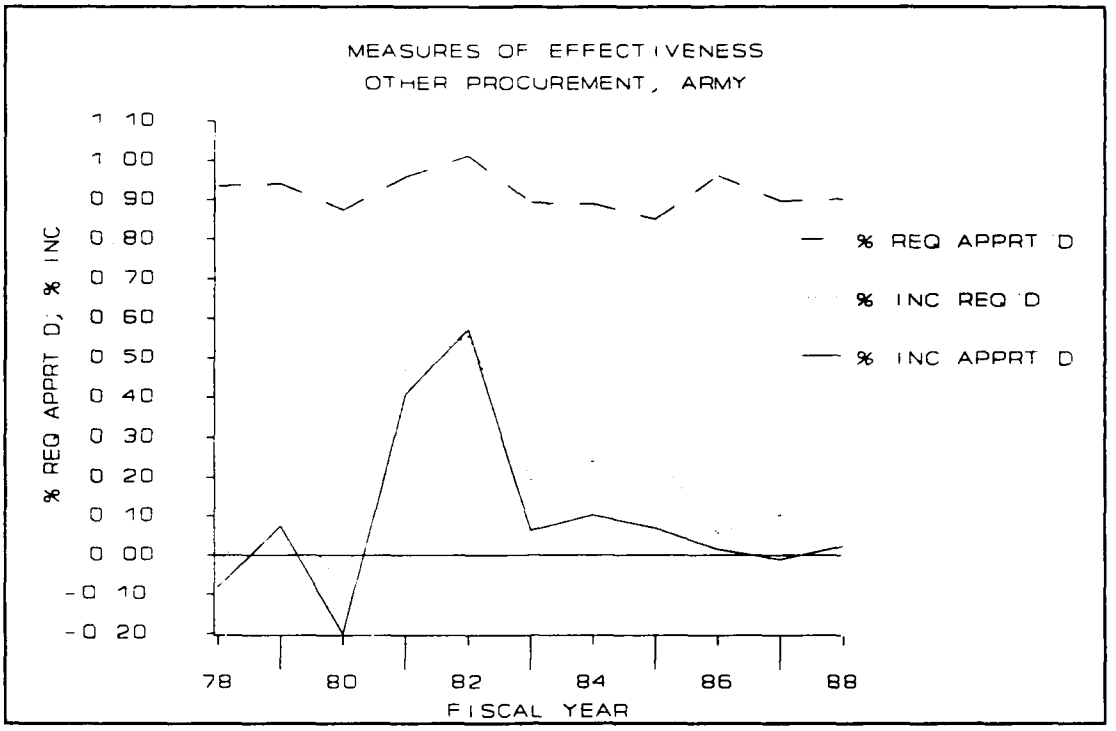
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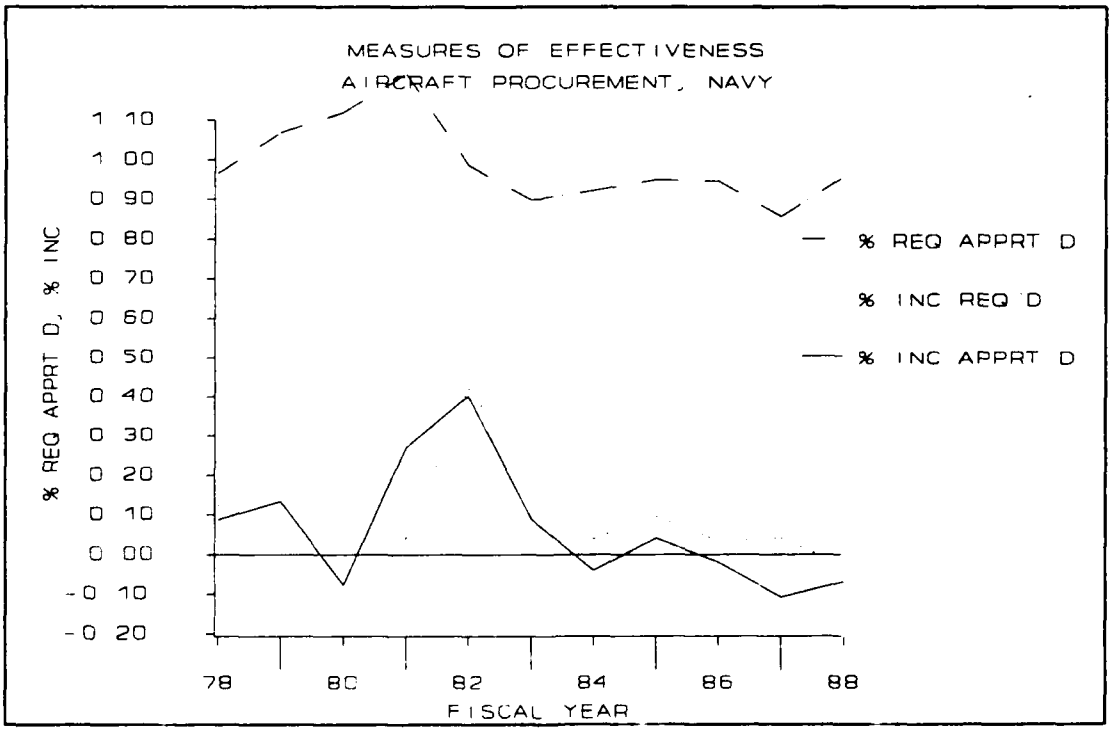
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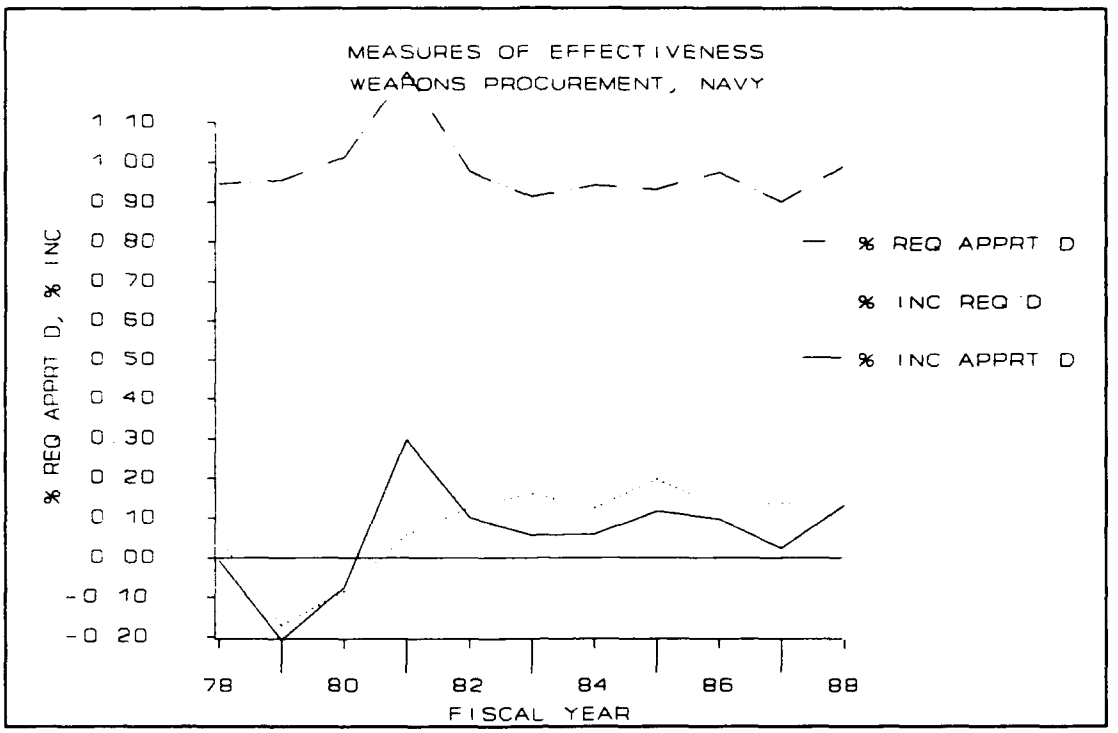
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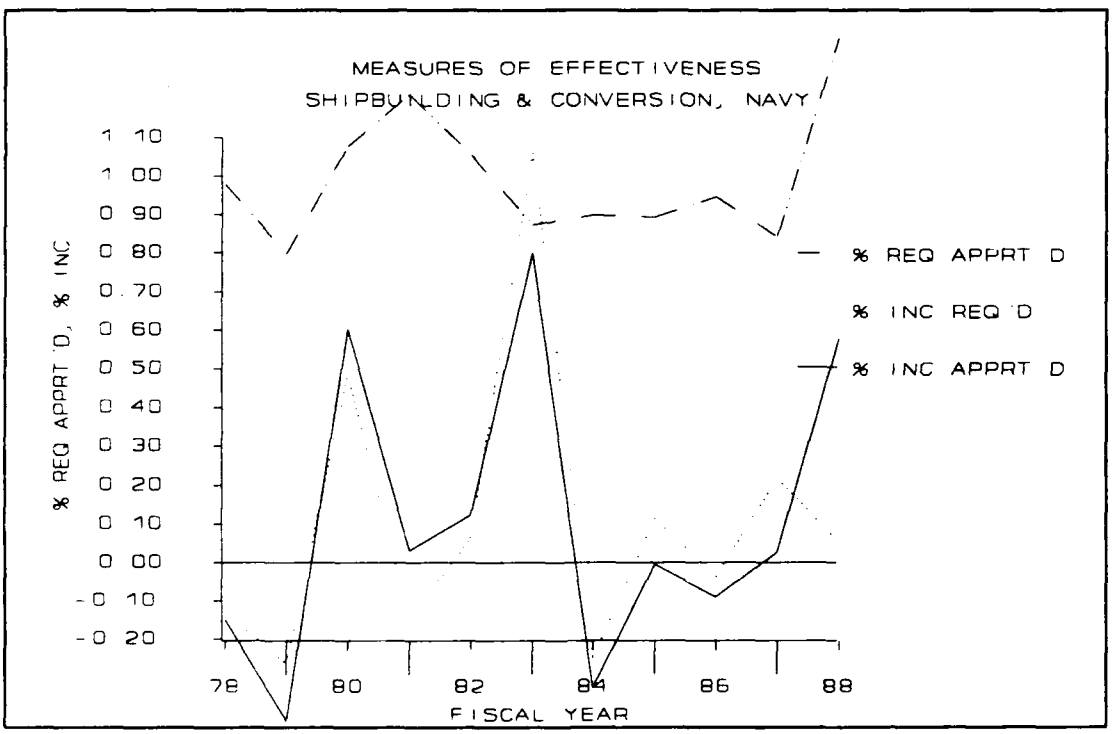
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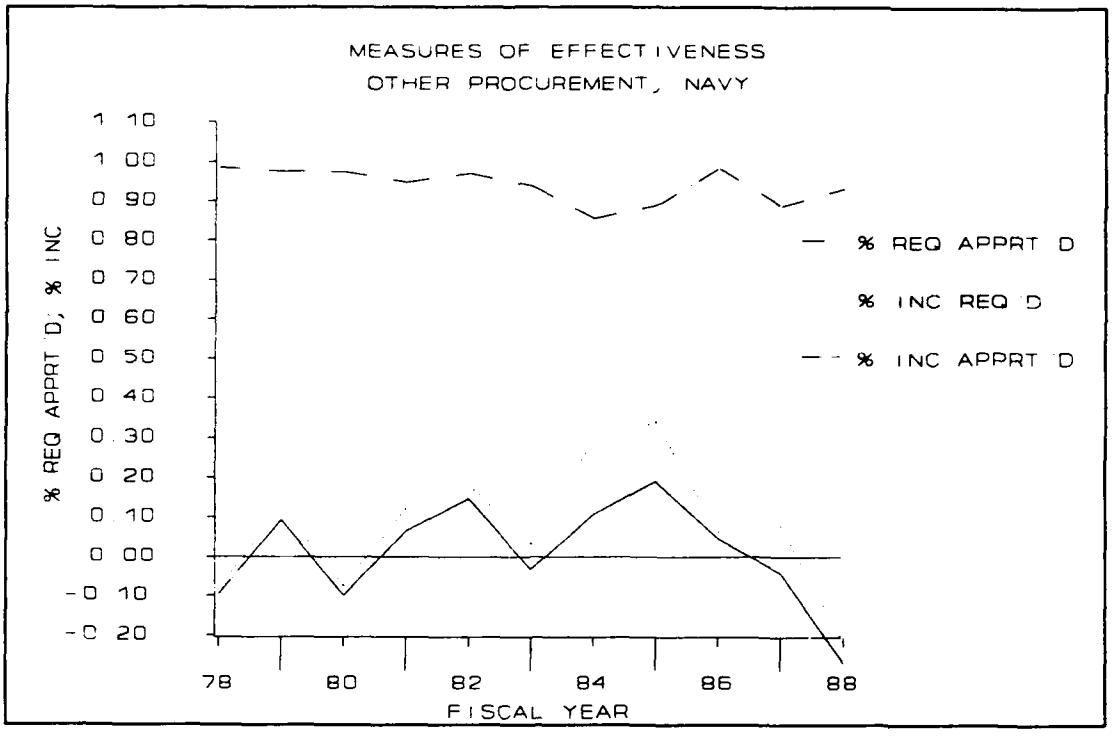
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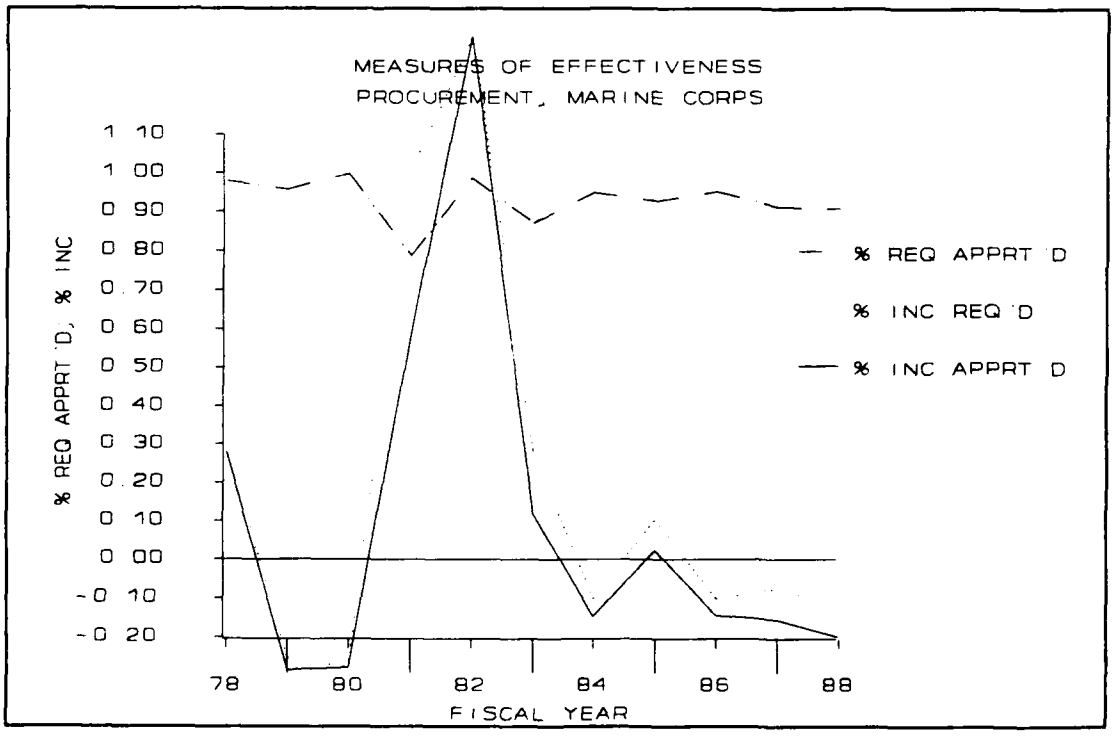
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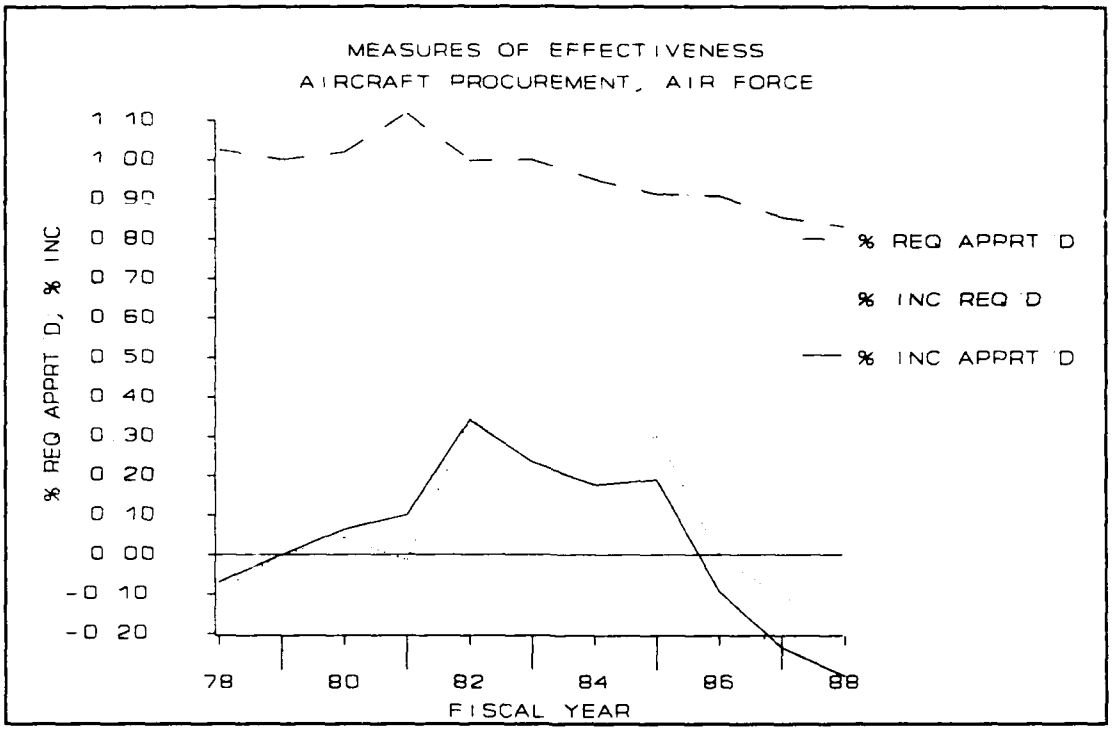
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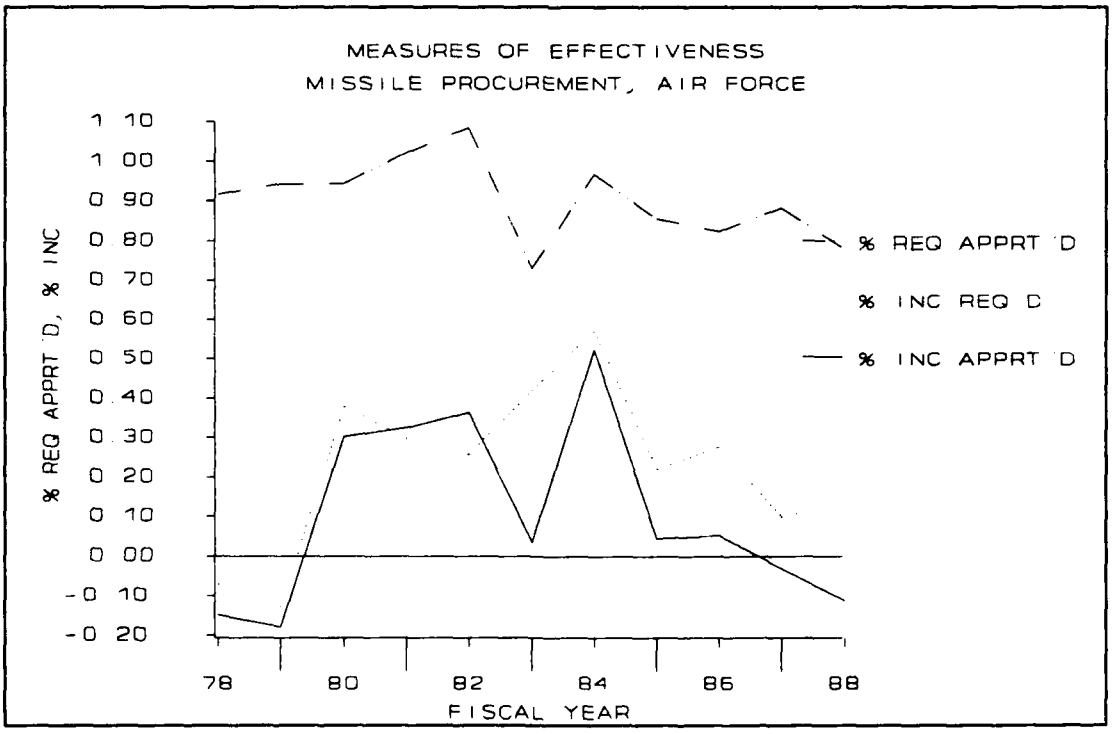
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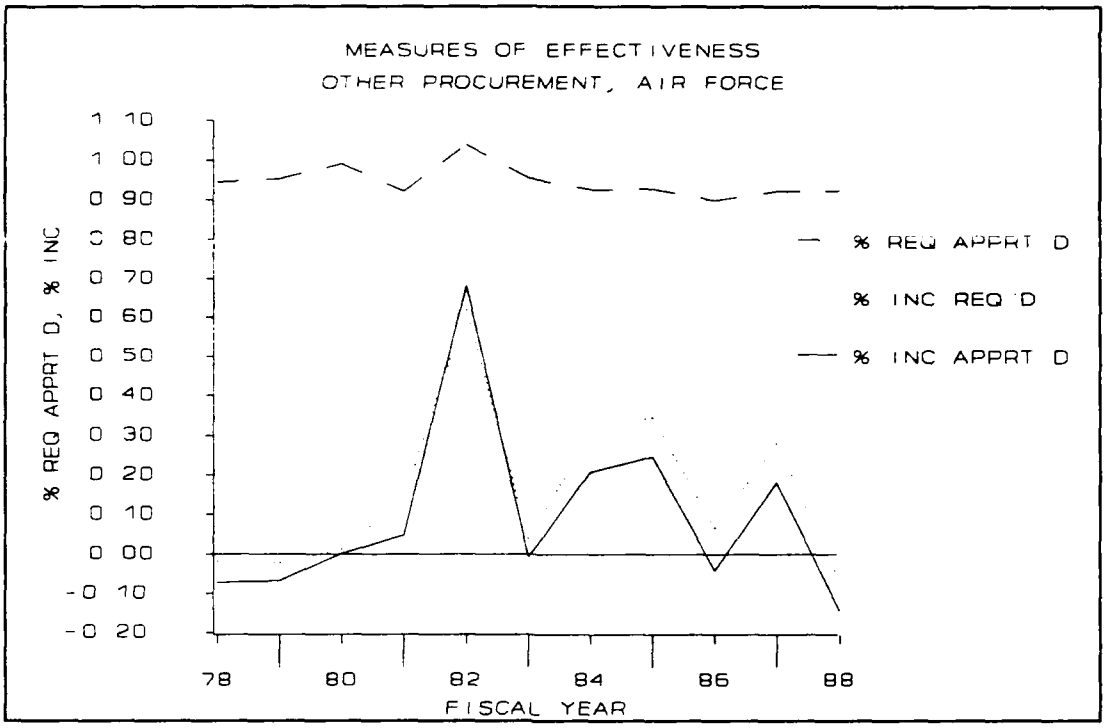
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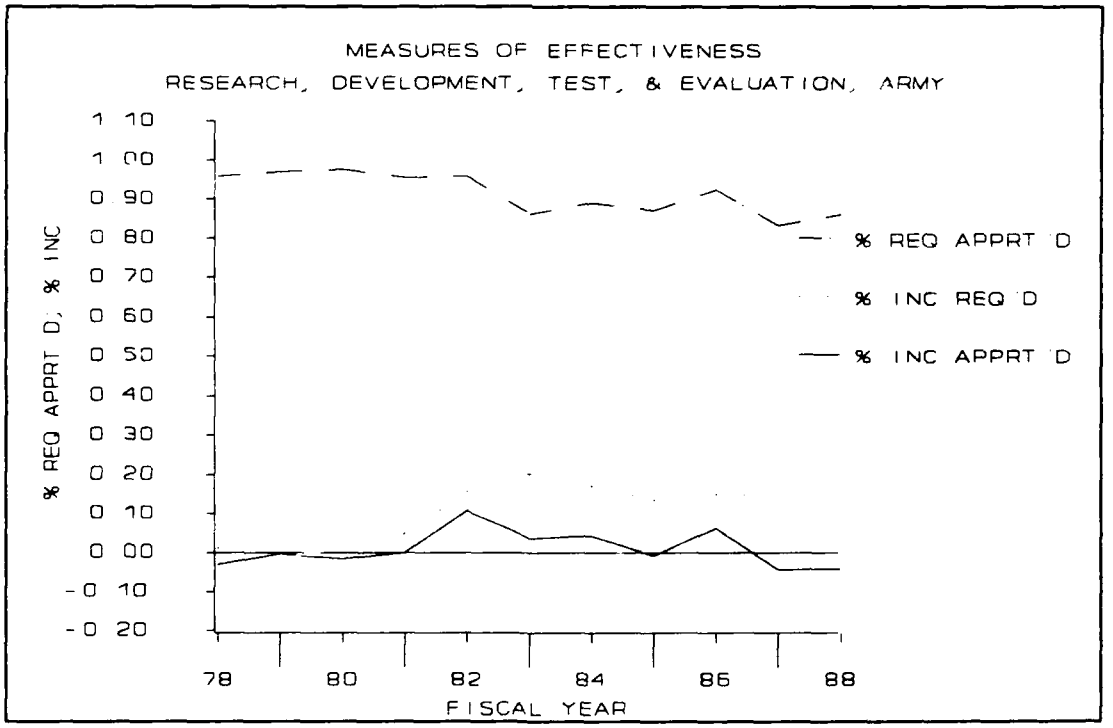
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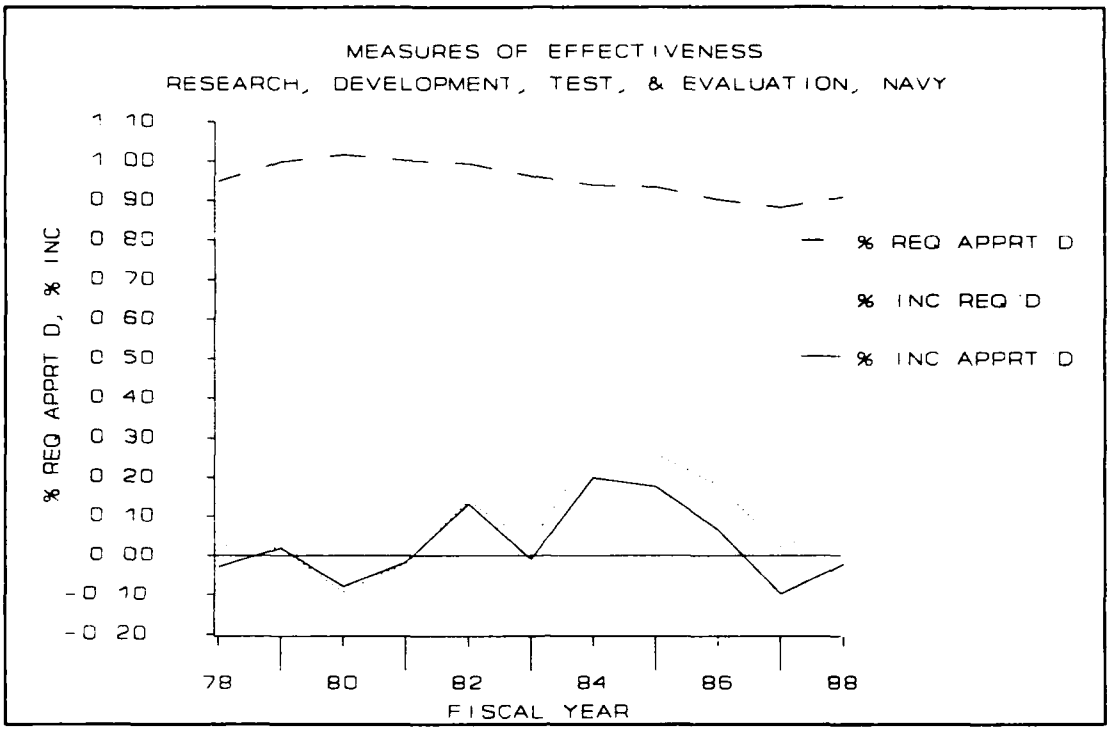
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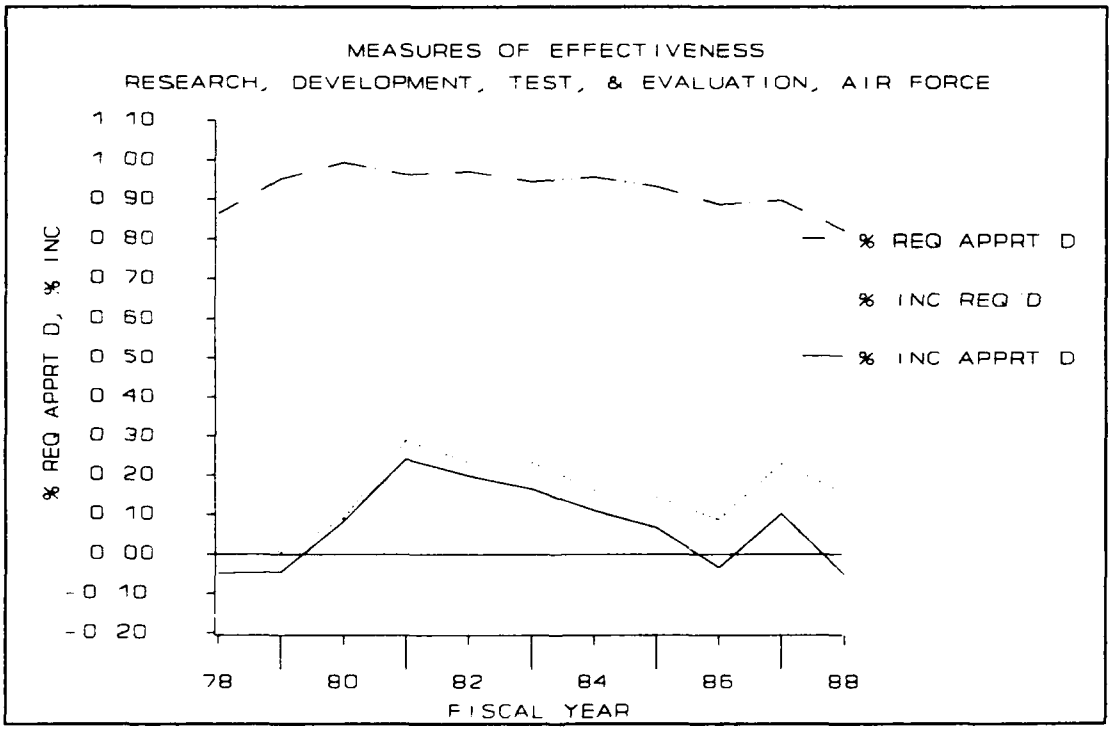
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APPENDIX F

GLOSSARY[10]

Appropriation Act - a statute, under the jurisdiction of the House and Senate Appropriations Committees, that generally provides authority for Federal agencies to incur obligations and to make payments out of the Treasury for specified purposes. An appropriations act is the most common means of providing budget authority. Currently there are 13 regular appropriations acts for each fiscal year. From time to time, Congress also enacts supplemental appropriation acts.

Appropriations Committee - a standing committee in either the House or the Senate with jurisdiction over governmental funding.

Armed Services Committee - either of the two authorizations committees in the House or Senate with cognizance over the Department of Defense and other national defense matters; see House/Senate Armed Services Committee.

Assertiveness - the tendency for agencies to pursue an active strategy of expansion in their programs and fundings, quantified in this thesis as the percentage increment requested over the current services baseline.

Autocorrelation - the statistical phenomena when the error terms or residuals from different points in time are correlated.

Authorizing Committee - a committee of the House or Senate with legislative jurisdiction over laws that set up or continue the operations of federal programs and provide the legal basis for making appropriations for those programs.

Authorizing Legislation - legislation enacted by Congress that sets up or continues the operation of a federal program or agency indefinitely or for a specific period of time. Authorizing legislation may place a cap on the amount of budget authority which can be appropriated for a program or may authorize the appropriation of "such sums as are necessary."

Base - a starting point for budget formulation that encompasses commonly shared beliefs by all concerned parties.

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[10]Definitions have been taken directly or adopted from the following sources: Bohrnstedt (1988), Giordano (1985), Goehlert (1979), Morse (1986), Ostrom (1978), Pfaffenberger (1987), U.S. General Accounting Office (1981), U.S. Senate Budget Committee (1985, 1988), and Wildavsky (1988).

Baseline - a set of projections showing the levels of spending and revenues that would occur for the upcoming fiscal year and beyond if existing programs and policies are continued unchanged, with all programs adjusted for inflation so that existing levels of activity are maintained; also called the current services or current policy baseline.

Biennial Budget - a two-year budget; DoD was first directed to submit a biennial budget by the DoD Authorization Act of 1987.

Bill - proposed legislation that may originate in either chamber, except revenue-raising bills, which must be introduced in the House. If a bill is not passed by the end of the two-year congressional term, it must be reintroduced the following Congress.

Budget - a formal plan of action or list of goals expressed in monetary terms.

Budget Amendment - a revision to some aspect of the standing budget request, submitted to Congress by the President before Congress completes appropriation action.

Budget and Accounting Act of 1921 - created the Bureau of the Budget (since 1970, called the Office of Management and Budget) and the General Accounting Office.

Budget Authority - authority provided by law to enter into obligations which will result in immediate or future outlays (payments) involving Government funds.

Budget Committee - established by Congressional Budget and Impoundment Control Act of 1974; see House/Senate Budget Committee.

Budget Year (BY) - the fiscal year for which the proposed budget is presented; Current Year + 1.

Calendar Year (CY) - 1 January to 31 December.

Claimant - major activity within an agency that receives an allocation of funds from the appropriation.

Coefficient of Determination (r^2) - a measure of the proportion of the total variation in the dependent variable explained by the regression.

Concurrent Resolution - used for matters affecting the business of both houses. They do not require the signature of the President nor do they have effect of law.

Concurrent Resolution on the Budget - a concurrent resolution that Congress is to adopt before 15 April which sets forth appropriate levels for the upcoming fiscal year for, among other things, budget authority and budget outlays for each major functional category, and total revenues.

Conference Committee - a joint committee composed of selected members from the House and Senate to resolve differences in passed bills.

Congressional Budget - the budget as set forth by Congress in a Concurrent Resolution on the Budget.

Congressional Budget and Impoundment Control Act of 1974 - established 1) a new Congressional budget process; 2) Committees on the Budget in each House; 3) a Congressional Budget Office; and 4) a procedure providing Congress control over the impoundment of funds by the executive branch.

Continuing Resolution - appropriations legislation enacted by Congress to provide temporary budget authority for federal agencies to keep them in operation when their regular appropriation bill has not been enacted by the start of the fiscal year. A continuing resolution is a joint resolution, which has the same legal status as a bill. It frequently specifies a maximum rate at which obligations may be incurred, based on the rate of the prior year, the President's budget request, or an appropriation bill passed by either or both chambers of Congress. A continuing resolution is a form of appropriation act and should not be confused with the budget resolution.

Continuous Variable - a variable that, in theory, can take on all possible numerical values in a given interval.

Cross-Sectional Analysis - an analysis of observations taken during a single period across a number of events.

Current Services Estimate - that amount required to continue federal programs and activities without policy changes from the fiscal year in progress.

Current Year (CY) - the fiscal year in which the budget is executed and immediately preceding the budget year.

Deficit - the amount by which total budget outlays for a fiscal year exceed total revenues for that fiscal year; includes the Social Security trust funds and other off-budget federal entities for purposes of calculation.

Deflator - a price index used to adjust data for inflation.

Dependent Variable - a variable that is affected by an independent variable.

Direct program - that program funding that directly supports the mission; total direct program is the subtotal for total obligation authority before adding reimbursable programs.

Fiscal Year (FY) - 12 month period used for accounting and financial reporting; it does not have to coincide with the calendar year. The U.S. Government's fiscal year runs from 1 October to 30 September. Prior to the Congressional Budget Act of 1974, the fiscal year was 1 July to 30 June (FY 76 ended 30 June 1976; FY 77 began 1 October 1976).

Fiscal Illusion - the phenomena of noticing a change in prices without considering the cause to be a general change in price levels, i.e., inflation.

Function - one of 19 categories into which the U.S. budget is broken down, e.g., National Defense, Agriculture, Medicare.

Gramm-Rudman-Hollings (GRH) - The Balanced Budget and Emergency Deficit Control Act of 1985 (Title II of Public Law 99 - 177, as amended by PL 100-119); jokingly referred to by the authors as a "bad law whose time has come"; ostensibly forces the legislative and executive branch to eliminate the federal budget deficit by FY 1993 by across-the-board cuts if agreement cannot be reached.

House Appropriations Committee (HAC) - consists of 57 Members; must report annual appropriations bills for the upcoming year by 10 June.

House Armed Services Committee (HASC) - consists of 51 Members.

House Budget Committee - consists of 23 Members as follows:

- 5 from the Appropriations Committee
- 5 from the Committee on Ways and Means
- 11 from other standing committees
- 1 each from the leadership of the majority and minority parties.

Membership is limited to no more than two Congresses (4 years) in any period of five successive Congresses (10 years).

Impoundment - a generic term referring to any action or inaction by an officer or employee of the U.S. Government that precludes the obligation or expenditure of budget authority in the manner intended by Congress.

Independent Variable - a variable that has a causal role in relation to a dependent variable.

Interquartile Range - the lower quartile of a set of measurements is the 25th percentile (that value at which 25% of the measurements fall below, when ordered from largest to smallest); the upper quartile is the 75th percentile. The interquartile range is the difference between the lower and upper quartiles. The larger the interquartile range is for a data set, the more variable (spread out) the set of measurements is.

Lapse - that part of budget authority that is not obligated during the specific period of time it is made available by Congress and thus expires.

Least-Squares Criterion - a mathematical criterion specifying that the sum of the squared vertical differences between observed data and a line representing an equation developed using regression analysis be minimized; also called ordinary least squares.

Linear Regression - an analytical method in which the mathematical criterion of least squares is used to fit an equation for a straight line through a number of paired observations.

Model - a simplified representation of a real world phenomenon.

Multiple Regression Analysis - a statistical technique for estimating the relationship between a continuous dependent variable and two or more continuous or discrete independent variables.

Multiple Regression Coefficient - a measure of association showing the amount of increase or decrease in a continuous dependent variable for a one-unit difference in the independent variable, controlling for the other independent variables in the equations.

New Obligation Authority (NOA) - the additional amount Congress appropriates for a program, over and above earlier appropriations.

Obligation - an action that will result in an outlay. Obligations include current liabilities for salaries, wages, and interest; contracts for the purchase of supplies and equipment, construction, and the acquisition of office space, buildings, and land; and other arrangements requiring the payment of money.

Office of Management and Budget - the President's office for governmental oversight of all executive agencies (formerly Bureau of the Budget).

Outlay - expenditures and net lending of funds under budget authority during a fiscal year.

Parameter - a numerical measure of a population characteristic.

Past Year (PY) - the fiscal year immediately preceding the current year; the last completed fiscal year.

Planning, Programming, and Budgeting System (PPBS) - an integrated system for the establishment, maintenance, and revision of the DoD budget; it combines policy formulation with budgetary allocation and provides a mechanism for analysis.

President's Budget - the document sent to Congress by the President in January of each year, requesting new budget authority for federal programs and estimating federal revenues and outlays for the upcoming fiscal year.

R^2 - see Coefficient of Determination.

Range - a measure of dispersion based on the difference between the largest and smallest values in a distribution.

Real - dollars after adjusting for inflation; constant.

Reappropriation - Congressional action that extends the availability of unobligated amounts that have expired (lapsed) or would otherwise expire.

Reclama - a formal challenge or appeal by a subordinate activity to a proposed or actual change (usually downward) to its budget request by its superior.

Regression Model - an equation for the linear relationship between a continuous dependent variable and one or more independent variables, plus an error term.

Reprogramming - utilization of funds within an appropriation account for purposes other than those contemplated at the time of appropriation; depending on the various threshold amounts, may require Congressional notification or approval.

Resolution - a measure concerning only the business or sentiments of a single house, having no legislative effect outside the house in which they originate. Resolutions become operative upon passage by that house and do not require approval by the other house or the signature of the President.

Scatterplot - a type of diagram that displays the association of two continuous variables as a set of points on a Cartesian coordinate system.

Senate Appropriations Committee - consists of 29 Members.

Senate Armed Services Committee - consists of 20 Members.

Senate Budget Committee - consists of 24 Members; must report Concurrent Resolution on the Budget by 1 April.

Simple Linear Regression - a type of linear regression in which there is only one independent variable.

Success - for purposes of determining budget success as defined in this thesis, the amount appropriated over the baseline estimate, expressed as a percentage.

Supplemental Appropriation - An act appropriating funds in addition to those in the 13 regular annual appropriation acts; it provides additional budget authority beyond the original estimates for programs or activities (including new programs authorized after the date of the original appropriation act) in cases where the need for funds is too urgent to be postponed until enactment of the next regular appropriation bill.

t-ratio - a statistical measure used to assess the precision and significance of individual variables.

Total Direct Program - see direct program.

Total Obligation Authority (TOA) - a DoD financial term which expresses the value of the direct defense program for a fiscal year.

Transfer - when specifically authorized in law, all or part of the budget authority in one appropriation account may be transferred to another account.

Transition Quarter (TQ) - the 3-month period between the end of FY 1976 and the beginning of FY 1977 resulting from the change from a 1 July through 30 June fiscal year to a 1 October through 30 September fiscal year beginning with FY 1977 (1 July to 30 September 1976).

Turbulence - the annual variations about the long-term mean level of funding actually appropriated by Congress.

Variable - a characteristic of an event that differs in value across such events.

Zero-Based Budgeting (ZBB) - a process emphasizing management's responsibility to plan, budget, and evaluate. ZBB provides for analysis of alternative methods of operation at various levels of effort, including the possibility that the activity in question will not be funded at all. It places new programs on an equal footing with existing programs by requiring that program priorities be ranked thereby providing a systematic basis for allocating resources.

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